This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

600058949+

STEVENS AND HOLE'S SCHOOL SERIES.

Works by Messrs. Stevens *and* Hole.

'HE GRADE LESSON-BOOKS, embracing Reading, Spelling, Writing, Arithmetic, and Exercises for Dictation: especially adapted to meet the Requirements of the Revised Code. Complete in Six Standards, price 5*s.* 3*d.*

STANDARD I. pp. 96, price 6*d.*
STANDARD II. pp. 128, price 9*d.*
STANDARD III. pp. 160, price 9*d.*
STANDARD IV. pp. 160, price 9*d.*
STANDARD V. pp. 224, price 1*s.* 3*d.*
STANDARD VI. pp. 224, price 1*s.* 3*d.*

*** The First Standard may now be had in Two Parts, price 4*d.* each; and Stand·ds II. and III. in Two Parts, price 6*d.* each.

ANSWERS to the ARITHMETICAL EXERCISES in Standards II. III. and IV. price 4*d.* in Standard V. price 4*d.* and in Standard VI. price 3*d.* or complete price 1*s.* cloth.

*** This series of reading-lesson books is now in very general use. It has been und of especial service in Schools where the teaching power is limited, and where ·course is therefore necessarily had to monitors, whose labours in class-teaching ıe *Grade Lesson Books* greatly facilitate.

'HE ADVANCED LESSON-BOOK, consisting of Reading Lessons in History Geography, Literature, and Science; together with a complete Course of Examples in the higher parts of Arithmetic and Mensuration, A SEQUEL to the Grade Lesson-Books, for the use of advanced classes in Schools and Institutes. 12mo. price 3*s.*

*** This book is well adapted for the class, in advance of the Sixth Standard, now gible for the increased Grant in Schools under inspection.

HE GRADE LESSON-BOOK PRIMER, for the use of Infant Classes; introductory to the 'Grade Lesson-Books.' With Ten attractive Woodcuts, price 3*d.*

IRST LESSONS IN READING, for the Class Teaching of Infants in Schools or Nurseries. Comprising Twenty-four folio sheets of Lessons printed in bold legible type, and interspersed with numerous attractive Woodcuts. Price 4*s.* 6*d.* in quires.

HE COMPLETE READER; or, a carefully Graduated System of Teaching to Read and Spell by means of attractive and instructive Lessons. Especially designed for Upper and Middle-Class Schools. In Four Books:—

I. The PRIMARY READER, crown 8vo. price 1*s.* 6*d.*
II. The INTERMEDIATE READER, price 2*s.*
III. The EXEMPLAR of STYLE, price 2*s.* 6*d.*
IV. The SENIOR CLASS READER, price 3*s.*

XAMINATION CARDS, WORD EXERCISES in ARITHMETIC, in Eight Sets, each Set consisting of Twenty-four Cards, with Answers separately printed, price ONE SHILLING per Set. For Examinations and Home Lessons in Public and Private Schools.

Simple Addition and Subtraction.
Simple Multiplication and Division.
Compound Rules (Money).
Compound Rules (Weights and Measures).
E. Practice and Bills of Parcels.
F. Vulgar and Decimal Fractions.
G. Simple and Compound Proportion.
H. Interest, Stocks, and Miscellaneous Problems.

*** This publication will be found especially useful in Schools receiving Govern-nt Grants, where H.M. Inspectors conduct the Examinations in Arithmetic by ns of similar Cards.

London: LONGMANS and CO. Paternoster Row.

STEVENS AND HOLE'S SCHOOL SERIES.

Works by Messrs. Combes, Stevens, *and* Hole.

THE READY WRITER: a Course of Eighteen Graduated Narrative Copy-Books, in oblong 4to. price THREEPENCE each, designed to meet as far as possible the Writing requirements of the several Standards of the Revised Code. and generally to lead to Good and Correct Writing.

An Edition, printed in PENCIL-INK, of 'The Ready Writer' BOOKS I. *to* VIII. marked BOOKS A *to* H, may also be had, price THREEPENCE each Book.

THE COMPLETE WRITER: a Course of carefully Graduated Narrative Copy-Books, designed to lead to Good and Correct Writing. For Upper and Middle-Class Schools. Complete in SIXTEEN BOOKS, quarto size.

Works by Messrs. Combes *and* Hines.

THE STANDARD GRAMMATICAL SPELLING-BOOK, price 1*s.* 6*d.* Or in Four Parts, PART I. price SIXPENCE, and PARTS II. III. *and* IV. price NINEPENCE each.

THE STANDARD ARITHMETICAL COPY-BOOKS, intended as a Finishing Course of Arithmetic in the several Standards of the Revised Code, calculated to ensure Good Figures, Concise Methods, and Correct Results. Oblong 4to. in NINE BOOKS, price SIXPENCE each.

THE COMPLETE ARITHMETICAL COPY-BOOKS, for Upper and Middle-Class Schools; being a carefully-prepared Course of Arithmetic, advancing Step by Step from the Simplest Elements to the Higher Branches of the Science. Complete in Nine Books, post 4to. size.

THE COMPLETE CIPHERING BOOK for Home Tuition and Private Schools, being the Nine Complete Arithmetical Copy-Books bound in One Volume,—may also be had, price 6*s.* 6*d.* cloth; or in THREE PARTS, price 2*s.* 6*d.* each.

SCRIPTURE FACTS CHRONOLOGICALLY ARRANGED, in Plain and Concise Lessons, with References and Questions for Self-instruction; forming a complete Abstract of the Old and New Testaments. 18mo. price 1*s.* 4*d.* or in Two Parts, *Old Testament Facts* and *New*, price 9*d.*

SCHOOL BOOKS BY MESSRS. COMBES AND HINES.

ARITHMETIC STEP BY STEP. PART I. the Six Standards of Arithmetic, according to the Revised Code, price 1*s.* PART II. designed for Pupil-Teachers and the Higher Classes in Schools, price 1*s.* Complete in 1 vol. 12mo. price 1*s.* 9*d.*

THE COMPANION EXERCISE BOOK to ARITHMETIC STEP BY STEP. An oblong 4to. Copy-Book, ruled in faintly-marked Squares, for Arranging and Entering Sums after the manner of the Examples in the Arithmetical Copy-Books.

IMPROVED SCHOOL REGISTERS; comprising Class Registers for Forty or Sixty Names, either for Nine or Twelve Weeks, both in 4to. and folio, price 2*s.* each; a Register of Admissions and Withdrawals, in folio, price 6*s.*; a Register of School Fees, in folio, price 2*s.*; the Teacher's Examination Schedule Book. in folio, price 5*s*; and the Teacher's Log Book, *or Diary of* School Work, in 4to. price 8*s.*; in all, Eight Registers.

London: *LONGMANS* and CO. Paternoster Row.

THE PRACTICAL

MORAL LESSON BOOK.

BOOK I. PART I.

OF DUTIES CONCERNING THE BODY.

LONDON: PRINTED BY
SPOTTISWOODE AND CO., NEW-STREET SQUARE
AND PARLIAMENT STREET

THE PRACTICAL MORAL LESSON BOOK:

EMBRACING THE PRINCIPLES WHICH, AS DERIVED FROM
THE TEACHING OF SCRIPTURE AND THE WRITINGS OF THE MOST EMINENT
AUTHORS, SHOULD REGULATE HUMAN CONDUCT.

Arranged and adapted more especially for the use of
Young Persons in Schools and Families.

EDITED BY THE

REV. CHARLES HOLE, F.R.G.S.

Curate of St. Saviour's, Herne Hill Road;
Head Master of Loughborough House School, Brixton; and Joint-Editor
of 'The Grade Lesson Books,' 'The Advanced Lesson Book,
'The Complete Reader,' &c.

IN THREE BOOKS.

BOOK FIRST.

OF THE DUTIES MEN OWE TO THEMSELVES.

Part I.—Of Duties concerning the Body.

'He that ruleth his spirit is better than he that taketh a city.'
'If thou be wise, thou shalt be wise for thyself.'—PROV. xvi. 32; ix. 12

LONDON:
LONGMANS, GREEN, AND CO.
1870.

[illegible]

A SCIENTIFIC STUDY OF HUMAN NATURE ESSENTIAL AS THE BASIS OF EDUCATION.

'Would not Education be necessarily rendered more systematical and enlightened, if the powers and faculties on which it operates were more scientifically examined, and better understood?'

Dugald Stewart.

IMPORTANCE OF MORAL INSTRUCTION.

'For certain it is, the great End of all Philosophy, natural and moral, is to know ourselves and to know God. It has often occurred to my mind in digesting my thoughts upon this subject, what a pity it is that this most useful science of morals should be so generally neglected. . . . Forming the manners is more necessary to a finished education, than furnishing the minds of youth. Socrates thought so, who made all his Philosophy subservient to morality.'

Preface to Mason's Self-Knowledge.

THE USE OF STORIES AND ANECDOTES IN MORAL TEACHING.

'Stories and anecdotes are very uninteresting, unless introduced to illustrate some point of instruction. To read and to tell them without illustrating some important, weighty instruction, is to make your dinner of the spices which are designed as a seasoning to your meat."

Dr. Todd.

PREFACE.

It will be allowed by all that THE STUDY OF THE WHOLE OF MAN'S NATURE is necessary to an efficient moral and religious education.

The recognition of the truth asserted in the above sentence has led to the production of the 'National Moral Lesson Books,' with a view to the supply of a want which, in the Editor's opinion, confirmed by that of very many eminent friends and promoters of Moral education, is greatly felt by Teachers of schools of all classes throughout the country. The Editor, in conjunction with an earnest student of Moral Science, has been induced to publish this Series in the belief that (1) the time is specially appropriate for its production, and that (2) the subject has not hitherto received the attention which its great importance demands.

(1) Whatever may be thought as to the propriety of the course, all parties must agree that the tendency of legislation in the present day is, if not to secularise education, at any rate to assert the principle that State aid should be given to all denominations alike for the purposes of education,

and that, in doing this, the most convenient course is to leave the teaching of religion to those who have immediate responsibilities respecting it, so that the public money should be awarded for the results of secular teaching only.

The Editor assumes that not only those who object to this principle, but also all who approve of it, recognise the paramount importance of religious and moral training as being the essential basis of true education; and that, inasmuch as the teaching of practical morality necessarily involves the teaching of practical religion, all will alike regard with favour an attempt to present a means of promoting this in a perfectly unsectarian form.

(2) It has been the conviction of the Editor for many years that Moral Teaching has not had that special attention which the importance of the subject demands. It is perfectly true that in most schools a Bible lesson is given daily; but in this, as a rule, while the facts of the Bible are considered, the enforcement of moral truths is left to the inclination of the teacher. Again, although every good reading-book is more or less a Moral Lesson Book, the Editor believes that no systematic method of Moral teaching for schools exists; and that, therefore, a work for the young which shall have for its object the exposition and application of Moral truth *in the various duties* of life, will meet an acknow-

ledged want in this important branch of elementary education.

Impressed with these convictions, the Editor presents the 'Practical Moral Lesson Book,' in the hope that it may be recognised by Teachers as a useful auxiliary to them in their efforts to give Moral teaching its due position in their schools.

Some may object to the introduction of Moral Lesson Books on the ground that the Scriptures, which are read in schools, contain sufficient moral instruction. It should, however, be remembered, that this objection applies with equal force to the introduction of all books of religious or moral instruction other than the Bible.

But the Editor believes that the general use of books for special instruction in the Morals of Scripture would confer great benefit upon the young, by inculcating more distinct, and therefore better, views of the elements of Morality than they now obtain.

Considering the early age at which children leave school, Moral Instruction can only be elementary, and the attempt to impart it in this elementary form is surrounded by difficulties which Teachers only fully understand. No conscientious teacher, however, can feel satisfied that his pupil should quit school without a knowledge of Morals which may at the least be equal to his knowledge of the ordinary *subjects of* school instruction.

In a vast number of cases it appears certain that if children do not receive such instruction in the day-school, they will be thrown upon the world in ignorance of this important branch of knowledge, at a time when they are not only susceptible of good impressions, but when they are also as susceptible of the attractions of vice. No one can contemplate so deplorable a result without wishing to use every available effort to prevent it.

It seems, therefore, necessary that direct and systematic Moral teaching should form part of the day-school duties, and that no school duly fulfils its functions in which the proper place is not assigned to the subject in the scheme of school-work. The 'Practical Moral Lesson Book' is intended to promote and facilitate the efforts of the Teacher in this direction.

Some works have appeared whose authors have had special Moral teaching in view, but it is believed that there is no work similar in plan and scope to the 'Practical Moral Lesson Book.' In this book the endeavour has been made to give a regular series of Lessons on those subjects included in the term *Morals*, and to present them in as great a variety and attractive a guise as possible.

The Editor is conscious that objections may be raised to this arrangement. It may be urged that the various duties of life are so intimately connected, that any attempt at a distinct division of them into parts or sections must be to some extent unsatisfactory.

In reply to this objection, he wishes to say that no claim is laid to a perfect arrangement of those duties. It has simply been attempted to connect and group together the most important of them for the purpose of forming an intelligible plan for a series of practical Lessons concerning them, in the hope that by such means they may be more clearly understood by the reader, and thus make a more lasting impression on his mind.

The Editor, therefore, presents the First Book, which it has been found expedient to publish in two separate parts—the first part more particularly treating of those subjects which may be classed under the duties men owe to the body. Care has been taken so to adapt the Lessons on these subjects—especially in the first few Lessons, relating to the Structure of the Human Frame—as to avoid, as far as possible, the use of technical terms, the introduction of which too often gives to a subject really as interesting as it is important a dry and repulsive aspect. The attempt has, therefore, been made to produce readable Lessons, which, it is hoped, may be found interesting as well as instructive to those for whom they are intended.

The work is divided into three books, and will be published in four volumes.

FIRST BOOK (In Two Parts).

THE DUTIES MEN OWE TO THEMSELVES.

'He that ruleth his spirit is better than he that taketh a city. If thou be wise, thou shalt be wise for thyself.'

PART I.—*Of Duties concerning the Body.*

PART II.—*Of Duties concerning the Mind.*

SECOND BOOK.

THE DUTIES MEN OWE TO ONE ANOTHER.

'Whatsoever ye would that men should do unto you, do ye even so unto them.'

THIRD BOOK.

THE DUTIES MEN OWE TO GOD.

'Let us hear the conclusion of the whole matter. Fear God, and keep His commandments; for this is the whole duty of man. This is His commandment, that we should believe on the name of His Son Jesus Christ, and love one another.'

In conclusion, the Editor begs to offer his grateful acknowledgments to the following authors and publishers for their kindness in permitting extracts to be made from their works:—Dr. Smith, S. Smiles, Esq., Messrs. Longmans and Co., and Messrs. Hopwood and Co.

CONTENTS.

PART I.

DUTIES CONCERNING THE BODY.

PAGE

N THE STRUCTURE AND FUNCTIONS OF THE HUMAN FRAME 1

N THE LAWS OF LIFE 37
  Example of the fatal results of ignorance of the laws of life 42

N PHYSICAL EDUCATION . . . 45
  What the ancients thought of physical education . 51

N HEALTH 53
  Results of ignorance of the laws of health . . 57

ONDITIONS OF HEALTH :—

ON FOOD 59
  Illustration of the folly of neglecting the subject of food 75

ON PURE AIR 77
  Instances of the effects of impure air on animals and man 87

ON LIGHT 90
  Illustrations of the effects of light on man . . 91

PAGE

On Cleanliness 94
Observations on the perspiratory pores of the skin, showing the importance of cleanliness in its relation to health 103

On Clothing 105
Example of the fatal results of disregarding the use of clothing 109

On Labour 111
Lives of great men a testimony to the necessity and importance of labour 116

On Exercise 118
Instances of the effects of exercise on health . . 130

On Recreation 134
Great men who valued recreation . . . 137

On Rest 139
Reflections of a king on sleep . . . 143

PROMOTERS OF HEALTH:—

On Temperance 144
Men who enjoyed robust health and lived long lives on account of their temperance . . . 148

On Chastity 151
Illustrations of the sad results of unchastity . . 157

THINGS INJURIOUS TO HEALTH:—

On Narcotics—

On Opium 161
Extracts from 'The Confessions of an Opium-eater' 163

On Tobacco 168
Experiments proving the injurious effects of tobacco . 172

On Alcohol 174
Effects of intoxicating drinks on the duration of life . 177

PAGE
On Tea and Coffee 180
Hurtful properties of tea and coffee, as shown by experiments on animals 181
Concluding Remarks on Narcotics . . 182
On Mental Excitement 185
Instances of the effects of mental excitement on the body observable in daily life . . . 188

ON HEALTH IN ITS RELATION TO THE INTELLECTUAL AND MORAL CHARACTER . 191

CONCLUDING REMARKS ON HEALTH . 195

ON SELF-PRESERVATION . . . 199
The story of a youth who disregarded the duty of self-preservation 203

MORAL LESSONS FROM THE TEACHING OF THE SCRIPTURES 206

MORAL SAYINGS OF THE WISE AND GOOD OF VARIOUS AGES AND NATIONS . . 210

BOOK FIRST.

OF THE DUTIES MEN OWE TO THEMSELVES.

PART I.

DUTIES CONCERNING THE BODY.

ON THE STRUCTURE AND FUNCTIONS OF THE HUMAN FRAME.

> Who can sufficiently admire the noble nature of that creature Man, who carries about with him the image of the whole Creation, and who is in himself a little world?

ALL *organic beings* are creatures capable of *life*, having either *vessels* or *nerves*, or more complicated structures, such as the *heart*, *lungs*, *brain*, *stomach*, &c. As these are called *organs*, beings possessed of one or all of these are called *organic beings*. Man possesses these organs, and therefore he is an *organic being*.

The science which teaches us the *structure* of organic beings is called *anatomy*, and the science which explains the *action* and *functions* of such beings is called *physiology*; and when these sciences relate to *man*, they are called *human anatomy* and *human physiology*.

In explaining the structure and functions of the human body, we adopt the following comprehensive division. First, the *bones*, or *skeleton*; second, the *muscular system*. These comprise what is called the locomotive system, whose parts act and re-act upon each other, fixing and giving to the body stability. Third, the *nutritive system*, which supplies the wear and tear of the body; fourth, the *nervous system*, which comprises the organs of sensation, reason, emotion, volition, &c.

THE SKELETON.

The skeleton is a strong framework of *bones*, upon which the superstructure of the body rests. These bones are not only intended to form the basis for the soft parts of the body, but also to enclose and support the important organs connected with the nutritive system.

The skeleton contains about *two hundred and fifty* bones, the *heaviest* of which, in proportion to their size, are those of the *skull*, the *pelvis*, and the *limbs*.

Hard and substantial as the bones appear, they were at first nothing more than a kind of *soft pulp*, which gradually became harder, and at the proper period acquired the necessary solidity.

The whole of the bones are composed of nearly the same materials, namely, *amindial.*or earthy substance, chiefly *lime*, and an *animal* substance called *gelatine.* Each bone is surrounded by a *membranous* covering, which contains numerous *blood-vessels.* On the *outside* of the bones are small openings, which·are the *mouths of tubes* having canals connected with them, and which *run through* the bones. The blood-vessels of the membranous covering enter these openings, and so convey the blood into the tubes and canals, by means of which it is distributed through the bones, thus giving them nourishment, and contributing to their growth, solidity, and strength.

The bones of the limbs are *hollow*, the cavity being filled with a substance called *marrow.*

The *ends* of bones are covered with a gristly substance called *cartilage*, which, together with the oil or *synovia* secreted in every joint, prevents them from being injured by the constant friction to which they are exposed.

The principal parts of the skeleton are the head, the trunk, and the limbs.

The Head.

The skull, which contains the *brain*, is fixed at the top of the *spine*, or bones of the back. The bones of the skull are united together in a very peculiar manner. The *edges* of the bones contain notches resembling the teeth of a saw. These enter and grow into each other; and as the bones are thicker at these joints than in other parts of the skull, they thus become *strongly locked together*. The bone of the *forehead*, or front part of the skull, is, unlike that of the lower animals, so formed as to convey an idea of power and dignity. The bones which form those parts of the sides of the skull are called the *temples*, to which the *ears* are attached. To the temple bones others are joined, which extend to the *top* or crown of the head, and attached to these are the bones which form the *back* part and *base* of the skull. The bones of the *under* part of the skull contain small holes, through which the *nerves* connected with the various *organs of sensation* communicate with the *brain*. Those parts of the front of the skull in which the *eyeballs* are placed are called *orbits*, above which there are firm ridges of bone, which, with the *eyebrows* attached to them, protect the *eyes* from injury. Beneath the orbits are placed the *cheek bones*, and between the cheek bones is the top or bony part of the *nose*, the lower or flexible part of which is composed of *cartilage*. The *upper jaws* adjoin the cheek bones, and the *lower jaws* have *hinge joints* near the holes of the *ears*, and by means of these hinges they are enabled to move in the various ways required. The *teeth*, which are intended for the *mastication* or chewing of food, are fixed in the *upper and lower jaws*. Each tooth is composed of two parts —a bony substance, which forms the *body of the tooth*, and a thin covering called the *enamel.* That part which is out of the jaw is called the *crown* and *neck* of the tooth, while the *fangs* or *roots* are planted deep in the jaw. There is a small cavity in the body of the tooth, which contains the *vessels* and *nerves* which were employed in the first formation and afterwards in the nutrition of the tooth.

The teeth which are first seen are called *milk teeth*, or *temporary teeth*, from their being intended to continue only a few years. They are *twenty* in number, and are divided into three kinds: namely, incisors, or cutting-teeth, of which there are eight; *cuspidate*, or dog-teeth, of which there are four; *molares*, or *grinders*, of which there are eight.

The *permanent* teeth are *thirty-two* in number, and are divided into three kinds: namely, *incisors*, of which there are eight; *cuspidate*, of which there are four; *bi-cuspidate*, of which there are eight; molares, of which there are twelve, *four* of the last being called *dentes sapientiæ*, or teeth of wisdom, from their not appearing till adult age.

The permanent teeth are more in number than the temporary, because of the disproportion between the size of the jaw in the young and adult. It was necessary when the jaw became larger that not only a supply of larger teeth but also additional teeth should be given.

The Trunk.

The spine, which is in the form of an italic *f,* consists of *twenty-four bones,* each bending and making a *joint* with its fellow. These are called the *twenty-four moveable vertebræ.* At the *lower part* of the spine is placed a firm, thick, strong, bony structure called the *haunches,* or hips, and *sacrum.* These encircle a sort of *hollow space* termed the *pelvis* or basin. The spine rests on the sacrum, which comprises *five* bones, and near the sacrum are *four* others called *caudal* bones. As these bones have *no motion* they are called the *nine immoveable vertebræ.* In the *centre* of the bones of the spine there is a tube containing a substance called the *spinal cord* or marrow, which is a prolongation of the *brain* and resembles it a good deal in its nature and functions. The bones of the spine or vertebral column all yield, in a slight degree, and permit in its whole line that degree of flexibility which is necessary to the motions of the body. Between these bones there is an elastic gristly substance which permits them to approach and play a little in the actions of the body. Whenever a weight is upon the head this gristle yields, and the moment it is removed the gristle regains its place, and the bones resume their position. The spine yields, recoils, and forms the most perfect spring, calculated to carry the head without jar or injury. The breadth of the basis on which the parts severally rest, and the closeness of the junction, give to the chain its firmness and stability; the number of parts and consequent frequency of joints its flexibility. This flexibility varies in different parts of the chain—is least in the *back*, where strength more than the power of bending is wanted; greater in the *loins*, which it was necessary should be more supple than the back; and greatest of all in the *neck*, for the free motion of the *head*. In order to afford a free passage for the descent of the *spinal marrow*, each of these bones is bored through in the middle, in such a manner as that when put together the hole in one bone falls into a line and corresponds with the holes in the two bones meeting it, so by that means the perforated pieces, when joined, form an entire, close, uninterrupted channel, at least while the spine is upright and at rest. But as a settled posture is inconsistent with its use, the bones or vertebræ are so locked in and confined as to prevent them from shifting one upon another as the body moves or twists, and thus they maintain their relative position nearly unaltered. For the *marrow-canal*, giving out in its course a supply of nerves to different parts of the body, notches are made on the upper and lower edge of each bone—two on each edge. When the bones are put together, these notches exactly fitting, form small holes through which the nerves issue out in pairs, in order to send their branches through every part of the body.

Near the *top* part of the spine are the *shoulder-blades*, which are flat and triangular. From the top corner of this triangle the bone turns round and thus forms the *shoulder*, into which is jointed the *collar-bone*, by the intervention of which the shoulder-blade is connected with the *breast-bone*. The collar-bone also serves to keep the shoulders apart, and preserve their firmness, while the arms are moving.

The ribs, which commence a little distance from the shoulder-blades, are *twenty-four* in number—twelve on each side. They are all attached behind to the spine. The fourteen *upper* ribs—seven on each side—come round from the back, and are joined in front by means of *cartilage* to the breast-bone. These are called *true ribs*. The next six ribs—three on each side, coming but partly round from the back—are not attached to the breast-bone in front, but merely to each other by *cartilage*. These are called *false ribs*. The lowest four ribs—two on each side—are not attached in front at all, but only to the spine behind. These are called not only false ribs but *floating ribs*.

The junction of the spine, the ribs, and the breast-bone, form the cavity called the *chest*, which contains the *heart*, *lungs*, &c.—the organs of the nutritive system.

The Limbs.

The upper limbs.—The *arms* are joined to the shoulder-blades. The *upper* bone of the arm works at the top in a shallow cup or cavity which is placed at one end of the shoulder-blade, the shallowness of this cup allowing the free action of the arm. The *fore-arm* is formed of *two bones*, one larger than the other. The top end of the smaller bone forms the *elbow*, and to the bottom of the larger bone the bones forming the *wrist* are attached. The bones of the fore-arm are so contrived that the larger bone will turn nearly round the smaller one, thus allowing of the twisting of the *hand*.

The *hands* are called the *extremities* of the *upper* limbs. There are connected with the hand *three* sets of bones,—those of the wrist, the flat part of the hand, and the fingers. The bones of the *wrist* are *eight* in number, formed in such a manner as to give great strength as well as to admit of the most delicate action. The bones of the *hand* are *five* in number. Each *finger* comprises *three* bones, and the *thumb two.*

The lower limbs.—The *legs* are attached to the haunch-bones or hips. The *upper* bone of the leg or *thigh, at the* top part, works in a deep cup or cavity on the side of the haunch-bone, the deepness of this cup affording a firm rest for the body while the legs are moving. There is a *round* bone at the *knee-joint* called the *knee-pan*, which gives firmness to the leg, and serves to assist the movement of the muscles which pass over it. The *lower* part of the leg is formed of *two* bones, one larger than the other. The larger bone is *three-sided* in shape, its sharp edge in front being called the *shin*. The bottom of this bone forms the *inner ankle*, and rests on a large bone in the front of the *foot*. The smaller bone is attached to the side of the larger bone, and its lower end forms the *outer ankle*.

The feet are called the *extremities* of the *lower* limbs. Connected with the foot are *three* sets of bones—those of the instep, the front part of the foot, and the toes. The bones forming the *instep* are *seven* in number, one very large of which forms the *heel*. Over this is a bone on which the largest bone of the lower part of the leg rests. The bones of the *front* part of the *foot* are *five* in number. Each *toe* comprises *three* bones, and the *great toe two*.

In concluding this part of our subject, we may here notice the remarkable correspondence which exists in the formation of the upper limbs, the lower limbs, the upper extremities and the lower extremities. For instance, the *upper* bone of the *arm* is similar in construction to the *upper* bone of the *leg*, and the structure of the *fore-arm* is like that of the *lower leg*. The bones of the *wrist* and *instep* resemble each other, the same analogy being seen in the bones of the *hand* and the *front* part of the *foot*; and lastly the *fingers* and *toes* exactly correspond both in the number and character of their bones.

In addition to these proofs of consummate skill and contrivance, we may notice others, as seen in the form, magnitude, mode, and junction of the bones, which all vary according to the design which they are intended to serve.

In the *arms* and *legs* great *strength* and *flexibility* are required; and here we have bones of *firm texture* with *joints* at certain intervals.

Where different degrees of *motion* are necessary, as in the *arms* and *legs*, we find the *joints* at the *shoulders* and *hips* admit of the *power of motion* in all directions, while in those at the *elbow* and *knee* there is only the power of *bending* and *extending* them.

In the *hand* and *foot* there is, by means of the *numerous joints* of the *fingers* and *toes* and the *mechanism* of the *wrist* and *ankle*, a *facility* given to the various important *actions* of the *hand* and to the more limited *motions* of the *foot*.

THE MUSCULAR SYSTEM.

Connected with the skeleton or bony system, is the *muscular* system. With bones only, we should not be able to move. *Muscles* are the *agents* by which bones are moved. To quote a comparison, the bones are to the body what the masts are to a ship, and the muscles are to the bones what ropes are to the masts and spars. As the masts and spars of a vessel must be sufficiently firm to sustain the action of the ropes, so must the bones possess the same quality to sustain the action of the muscles in the human body.

The muscles are distinct portions of flesh, capable of contraction and relaxation; they are composed of *fibres* exquisitely fine in texture. These fibres are of two kinds, the one soft and irritable, of a red colour, which generally constitute the body of the muscle, whilst the other sort are found for the most part in the extremities, and are of a harder texture and of a white, glistening colour. If these are formed into a round, slender cord, they are called *tendons*. The red colour of the muscular or fleshy parts is owing to innumerable *blood-vessels* that are dispersed through their substance. The blood-vessels are accompanied by *nerves*, and they are both distributed so abundantly in the fleshy parts, that in endeavouring to trace the course of the blood-vessels in a muscle, the muscle would appear to be formed altogether by their ramifications, and in an attempt to follow the branches of its nerves they would be found to be equally numerous.

There are rough places, and pits, and little projections on bones serving for the attachment of muscles, but they are generally attached to the bones by means of *tendons*, and are so situated that, whatever motion the joint annexed is capable of performing, the muscle is adapted to produce it. The *knee* and *elbow* furnish examples of this agreement. The *shoulder* and *hip joints*, by their construction, admit a sort of sweeping or circular action, and are accordingly supplied with muscles adapted to it.

When the muscle is in action, the fibres become shorter and the body swells. Experiments show that the nerves and a regular supply of blood are essential to this contraction, and that it is regulated by the *mind*, at least in the *voluntary* muscles—namely, those muscles that move the limbs or any other part dependently upon our *will*. But there are others called the *involuntary* muscles, which operate *without* even our *consciousness* of the action that is continually going on within us. Such is the *heart*, which is itself a muscle.

Most muscles have others opposed to them, which act in a contrary direction, and are called *antagonists*. Some of these act in succession, as when one muscle or one set of muscles bends a limb, another extends it; one elevates a part, another depresses it; one draws it to the right, another to the left. By these opposite powers, the part may be kept in a middle direction, ready to obey when called to act.

Four hundred and forty-six muscles have been described and their uses ascertained. It has been said that not less than a *hundred* are employed every time we *breathe*; yet we draw our breath every moment without considering or even being sensible of, the vast and complicated apparatus that is necessary to effect it.

Those important faculties of *sight* and *hearing* depend upon muscles so extremely small that they must be magnified to be visible. In the *tongue* the muscles are very numerous, and so complicated with one another, that the nicest dissectors cannot trace them; yet they are so arranged that they never interfere with each other, nor interrupt the various offices of speaking and swallowing. In the other parts of the body the same admirable economy prevails. The muscles are everywhere diffused; they lie close to each other in layers, as it were, over one another, often crossing, sometimes passing through, and even imbedded in one another; yet each is at perfect liberty to perform its peculiar office without interrupting the power of its neighbour.

The action of muscles is often required where their situation would be inconvenient. In such a case the body of the muscle is placed in some commodious position at a distance, and communicates with the point of action by means of slender *tendons*, or strings resembling wires. If the muscles which move the fingers had been placed in the palm or back of the hand, they would have enlarged it to a clumsy and very inconvenient thickness. They are therefore disposed in the arm, and even up to the elbow; from this position they act by long tendons, strapped down at the wrist by *ligaments*, beneath which they pass to the fingers. The same arrangement is observed in the muscles that give motion to the toes and many of the joints of the feet. Instead of swelling and distorting the foot, they form a graceful enlargement of the calf of the leg. The variety in the figure of the muscles, according to their situation and office, is likewise beautifully contrived; some have double, some triple tendons, others none; in some places one tendon belongs to several muscles, in other places one muscle to several tendons. One set of muscles enables us to move a certain part one way, and a different set enables us to move it another way. That we have the power to frown, smile, cough, breathe, to lift or close our eyelids, raise or bend our heads, stoop, incline to one side or the other, move our fingers or toes, raise or depress our limbs, walk or sit down, speak or sing, swallow, open or shut our mouths, or perform any action whatever, we owe to particular muscles which are appointed to set that part in motion.

The Ligament and Cartilage.

The elastic substance that keeps the bones connected with one another while moving is called the ligament.

The *ligament* is a whitish or yellow substance, so strong that a bone will oftener break than a ligament tear. There are little pits or rough places in the bones where these ligaments are fastened. The *knee joint* may serve to illustrate ligament. We want there a great capacity for motion, as well as strength; consequently, there are rough ligamentous strings running from one bone to the other—in front, behind, on each side, and in the centre of the joint.

Still further to facilitate motion, there is a slippery, oily-like fluid, called *synovia*, which oozes into the joint from a gland just as it is wanted, and the ends of the bones are tipped with what is called *cartilage*—a smooth, shining and slippery substance. Now the joint is complete and easy of motion.

But there is another use for ligament and cartilage. If we jump down upon the feet, we feel a very great shake, which hurts us, and which, if there was no contrivance, would destroy us by shaking violently the brain and other parts which will not bear it. By jumping on the fore part of the foot we come down without any shake or jar. This is chiefly owing to the *ligaments* and *cartilages* between the ones of the feet, and to an India-rubber-like ubstance between each of the twenty-four ones which form the *vertebral column*, or back-one.

The Integuments, &c.

The *integuments* form that substance which overs every part of the surface of the body. They consist of three parts—the scarf-skin, a mucous network below it, and the true skin.

The *scarf-skin*, or cuticle, which is intended o protect the parts beneath, and to preserve heir sensibility, is itself insensible. A blister will raise it, and strong work will harden it; and fter many severe complaints the skin peels off. The scarf-skin has in it various minute holes or *pores*, by means of which *perspiration* is effected, nd through which the *air* issues.

The *colour* of the scarf-skin varies very little n the different races of mankind. The seat of olour is a very thin layer of soft substance, which is interposed between the scarf-skin and he true skin, and is termed the *mucous network*. n the negro it is of a very dark colour, and the olouring matter is capable of being communi-ated to water. The true skin and the parts below are of the same colour both in whites and blacks.

The *true skin* or cutis constitutes the *organ of ouch*. This power exists in the greatest degree t the ends of the fingers, in slight elevations of the skin, called *papillæ*. The immediate *organs of sensation* are, however, small white threads called *nerves*, which are more or less immediately derived from the *brain*.

The *nails* on the fingers and toes, which are intended to protect the delicate nerves at their ends, are composed of hardened scarf-skin. They grow from the lower part, and from small roots underneath them.

Hair grows through the scarf-skin, and is produced from small bags which are found in the true skin. Every hair has a root, and by means of *glands* a kind of fatty substance is conveyed into it, by which it is nourished. In each hair there are numerous small cells, in some of which the colouring matter of the hair is found. When the hair is not properly nourished it dies and falls off, thus producing baldness, and when the colouring matter becomes dried up the hair turns grey or white.

THE NUTRITIVE SYSTEM.

NEXT to the muscular system comes the *nutritive system*, which embraces the stomach, liver, heart, lungs, &c. The general office of these organs is to *digest the food*, convert it into chyle, absorb the chyle and convey it through the body by muscular action, and eject the refuse from the system.

The Stomach.—During the action of chewing, the food is mixed with *saliva.* The food is then carried backwards into a sort of pouch at the back part of the mouth, from which it immediately descends into the gullet, at the extremity of which is the *stomach*, in which the food is deposited.

The passage from the mouth to the windpipe lies immediately before the passage to the stomach. We might suppose that the food would pass into the first opening, namely, the passage to the windpipe, before it reached its own proper passage; and this would be the case, were it not that there is a little valve standing erect before the passage to the windpipe, which the food in its way to the gullet presses down, and thus closes the anterior opening of the gullet. Were this passage left open, we would be in danger of being choked by every morsel we endeavoured to swallow.

The *stomach* is a kind of membranous bag, not very unlike the bag of a bagpipe, lying across the body and having two openings—the upper towards the left side, by which it receives food from the gullet, and the lower on the left side, by which the food passes into the intestines. Its *inner* coat consists of a soft membrane, which is carried through the whole *alimentary canal.* Its *middle* coat is muscular, and by means of this coat the stomach has the power of emptying its contents. Its *outer* coat is a membranous covering, common to the stomach, intestines, and all the other organs contained in the cavity of the *abdomen*. At the lower opening of the stomach is a contraction which prevents the too ready passage of the food downwards. Between its coats are various small glands, which secrete and pour into the stomach a fluid called the *gastric juice*, which dissolves the substances taken into the stomach, converts them into a uniform greyish pulpy mass, called *chyme*, and thus fits them for becoming nourishment. *Digestion* is totally independent of any pressure which is exercised by the coats of the stomach, for it has been found that if portions of food were placed in silver balls and these swallowed, such portions would be dissolved.

When food has undergone the change which it is meant to suffer in the stomach, it passes through the lower opening into the *intestines*. When the food has passed into the intestines, it receives the *bile*, which is a secretion conveyed by means of a small pipe or *duct* from the *liver*, and the *pancreatic juice*, which is the secretion of the *pancreas* or sweetbread, as it is called. By the mixture of these substances the food is so far altered in its nature as to be capable of affording *chyle*, which is a fluid like milk. This fluid is taken up by small vessels, spread upon the surface of the intestines. These small vessels uniting together convey their contents into one of the larger *blood-vessels* of the body, and thus supply the means of nourishment to the whole system. That part of the food which cannot afford nourishment is carried off as excrementitious matter.

The *liver* is situated within the edges of the ribs, and is, as we have stated, the organ where bile is produced.

Circulation of the Blood, &c.

The *blood* is the medium by which all the solid and fluid parts of the body are supplied with nourishment. It consists of a solid matter called *fibrin*, of a *red colouring matter*, and of *serum*. The purpose of its circulation through the body is to supply the daily waste which takes place.

The *heart* is the grand reservoir of the blood, whence it flows through the *arteries* to the utmost extremities of the body, and is conveyed back again by the *veins*. It is situated in the chest, between the *two lobes of the lungs*. In man it is placed almost crosswise. The *base*, or broad part, is directed towards the *right side*, and the *point* towards the *left*. It is securely inclosed in a *membranous sack*, or pouch, which contains a fluid that gives smoothness to its surface and ease to its motions.

The substance of the heart is entirely fleshy or muscular. Its basis, from which the great blood-vessels *originate*, is covered with fat, and it has two hollow appendages, called *auricles.* Within, it is divided into two cavities or *ventricles*, separated from each other by a fleshy partition. The use of these ventricles and auricles is to circulate the blood through the whole body, by means of the power of contraction and enlargement which the heart possesses, from its numerous fibres, that surround it in a spiral direction. When these fibres are contracted, the sides of the muscular cavities are necessarily squeezed together so as to force out of them any fluid which they may contain. By the relaxation of the same fibres, the cavities become dilated, and of course prepared to admit any fluid which may be poured into them. The great trunks, both of the arteries which carry out the blood and the veins which bring it back, are inserted in the cavities. By dilating the fibres, which anatomists call *diastole*, the cavity of the ventricle is open to receive the blood from the auricles; on the contrary, when the ventricles are contracted, which is called *systole*, the auricles are expanded; and by this alternate action they carry on the wonderful operation of supplying with blood the most distant parts of the body.

The blood which has been ejected from the auricles and ventricles is prevented from returning by *valves*, or little doors, placed between the auricles and ventricles, and at the *mouths of the* great arteries. These valves open *inwards*, but not in the contrary direction. Of course, when the blood has passed through them, the valves close, and a return is thus rendered impossible.

You may perceive by this account that there is a continual exchange of the blood that fills the heart. It is no sooner emptied into the arteries than it is filled again from the veins; and this contraction and dilatation succeed each other with great rapidity, and by its re-action causes that *beating* at the *wrist* and other parts that is called the *pulse.*

The chief distinction between the arteries and veins lies in this. The *arteries* convey the blood *from the heart*, the *veins* carry it *back again.* In order to effect this purpose, the veins are continued from the extremities of the arteries, and in general every artery is accompanied by its corresponding vein.

That we may more clearly understand this subject, let us suppose two trees united to each other by the extremities of their branches at the top, and their trunks terminating at the same point at the bottom, each being hollow from the roots to the tips of the smallest twigs, and filled with a fluid which circulates incessantly from one through the other. This will give us an idea of the circulation of the blood through the vessels of the human body. Four large vessels, from which all the rest proceed, pass out from the base of the heart, two of which are *arteries*, and the other two *veins.* The *aorta*, which arises from the left ventricle of the heart, is the principal artery that distributes the main stream of the blood through innumerable ramifications to all parts of the body. The *pulmonary artery* originates from the right ventricle, and enters the lungs, where its branches are spread out on the air-vessels. By this means the blood is acted upon by the air which we inhale, and undergoes a necessary change. All the veins which bring the blood from the upper extremities, and from the head and heart, pass into a large vein called the *descending vena cava.* Those veins which bring the blood from the lower extremities pass into another large vein, called the *ascending vena cava.* These two large veins unite as they approach the heart, and open by one common orifice into the right auricle. The return of the blood is promoted by the action of the muscles, the pulsation of the arteries, and the valves which are formed in the veins. These valves are so nicely adapted to their design that they admit the blood to flow from the extremities, but oppose its returning back towards them.

It is supposed that the quantity of blood contained in the body amounts to between *twenty-five* and *thirty-five pounds*, and that about *two ounces* pass on from the heart at *each pulsation.* In this way, at seventy pulsations in a minute, 140 ounces will pass through the heart in a minute, or 8,400 ounces in an hour. Hence the whole quantity of blood contained in the body, supposing it to be twenty-five pounds, will pass through the circulation in about three minutes, or about twenty times in an hour, or 480 times in a day.

Respiration, &c.

In forming the organs of *respiration*, the Creator had two great objects in view—one the formation of the voice, the other that of completing the changes which are requisite for adapting the blood to the functions which it is intended to perform.

The organs of respiration consist of the *larynx*, the windpipe, and the *lungs*.

The *larynx* is the projecting part which you can see and feel at the upper part of the throat. It is the commencement of the windpipe, and is the organ where the *voice* is formed. The windpipe is the tube which is connected with this, and is divided first into two and then into smaller branches called *bronchia*, which at last terminate in small cells that form the minute structure of the lungs. These organs can only be considered as subservient to the more immediate functions of respiration. There are other parts which are necessary for carrying on the mechanical process of admitting and ejecting the air from the lungs, and these are principally a very large and strong muscle called the *diaphragm*, which separates the cavity of the abdomen from the chest, and various small muscles which lie between the ribs.

The mechanism employed in dilatation and expansion is exceedingly simple. The contraction of the diaphragm forces down the *abdominal viscera*, and thus enlarges the cavity of the chest downwards, while the action of the muscles between the ribs raises them and produces an expansion in another direction. The necessary effect of this increase of size is that the air rushes into the windpipe to supply the void which would otherwise occur, and when the diaphragm and *intercostal* muscles cease to act and become relaxed, the elasticity at the cartilaginous parts of the chest, but more particularly the tendency of the muscles of the abdomen to recover themselves, has the effect of diminishing the cavity in the chest, and of thus forcing out from the lungs the air which has been received by inspiration. The alternate dilatation and contraction of the chest which thus takes place constitutes the act of *respiration*, which is partly dependent on the *will* and partly independent of it.

The *lungs* are of a light spongy texture, capable of swimming in water. A membrane passes from the *breast-bone* and separates the *two. The right lung* is nearly a third larger than the *left*, and consists of *three lobes*, while *the left* has only *two*.

The lungs are very largely supplied with *blood-vessels*, of which some appear to be destined for the nourishment of the organ, but by far the principal part to convey the blood from the right side of the heart, in order that it may, after minute division and diffusion over the *air-cells*, be exposed to the influence of the external air, and be carried back to the heart in a proper state for nourishing the body.

The blood which passes from the right side of the heart into the lungs is of a dark red colour. After circulating through the lungs it becomes of a florid red, and has then been rendered fit for nutrition. In this progression through the lungs it has been freely exposed to the air of the atmosphere, which is continually received and thrown out by the alternate actions of inspiration and expiration.

Atmospheric air is composed of about *twenty-one* parts by measure of *oxygen*, or the respirable part, and *seventy-nine* parts of *nitrogen*, or the unrespirable part, with a small portion, not exceeding *two per cent.*, of *carbonic acid gas*. When an animal is confined in a certain quantity of atmospheric air, a part of the oxygen disappears, and an augmented quantity of carbonic acid gas is found to have been produced. Now, it is *supposed* by physiologists that part of the oxygen is absorbed by the blood giving it a red florid colour, and is carried through the body that by its union with other elements it may form a species of *diffused combustion.*

The remainder of the oxygen changes the venous blood in the lungs by absorbing *carbon* and forming *carbonic acid.*

It appears that about forty cubic inches of air are taken in at an ordinary inspiration, and if we suppose that we respire sixteen times in a minute, we shall respire during the *twenty-four hours* 921,600 cubic inches, or 533 cubic feet of air.

THE NERVOUS SYSTEM.

THE *nervous system* constitutes the grand medium through which we have communication with every part of the body and the external world, and therefore contains the central and governing apparatus of *life.* It consists principally of the brain, spinal cord, and nerves.

The Brain is a soft matter, of a yellowish colour, and of a cheese-like consistence, the whole weighing generally *about three pounds.* It is surrounded by three membranes, and lies beneath the bones of the skull. It is divided by strong membranes into two main sections—one called the *cerebrum*, or proper brain, which occupies the *front*, *top*, and *sides* of the *head*; the other called the *cerebellum*, or lesser brain, which lies *behind*. Both are longitudinally divided into halves, or *hemispheres*, and also into small parts called *lobes*.

The Spinal Cord, which is about the thickness of the middle finger, issues from the lower part of the brain, behind. In substance it is similar to the brain, of which it seems to be a prolongation.

The Nerves.—Muscles are merely the agents of motion; they must receive both the order and the power to move through other agents. These agents are the *nerves*. The nerves are little white strings, and are the means of communication between the brain and all other parts of the body.

The nerves of *motion* are those by which communications are conveyed *from the brain* down to the muscle requiring movement. No muscle can move unless it receives this impulse from the brain; consequently, every muscle is supplied with nerves from the brain or spinal marrow, and if by any disease or accident the nerve is *injured*, the muscle cannot move, let the will to do it be ever so strong. Thus, for example, when a paralytic person loses the use of an arm or a leg, it is because the *nerves* are somewhat injured. Hence in every motion there is a continual guiding and restraining influence kept up by the brain and spinal marrow over the muscles.

The nerves of *sensation* are bound up in the same bundles with the other nerves, but they are *distinct in action.* To this class belong the nerves of *feeling* or touch, the *organs* of which are diffused generally over the whole body, being found very numerous at the ends of the fingers, which are calculated to communicate minute impressions with great accuracy. When these organs are brought into contact with any object, an idea of heat, cold, hardness, softness, &c., is by means of these nerves conveyed to the brain. If we put our fingers too near a hot place, the *nerves of sensation* in those fingers convey to the *brain* instantaneously a knowledge of it, and the influence of the will passes down through the *nerves of motion*, causing the muscles to remove the finger. Thus, we see that if there were no nerves of sensation in the fingers, they might actually be on fire and be destroyed without our knowing it. Hence pain is only an unpleasant sensation which warns us to remove the agent which causes that pain.

But there are also other nerves connected with sensation, called *nerves of special sensation.* Under this class we have the nerve of sight, or *optic* nerve; the nerve of hearing, or *auditory* nerve; the nerve of smelling, or *olfactory* nerve; the nerve of taste, or *gustatory* nerve.

The *organ* of *sight* connected with the optic nerve is the *eye.* The eye-ball, which is globular in form, contains *three* coats, the *outer* one of which forms the *white* of the eye. In front of the eye is a hard projection, called the *cornea*, at the back of which are the *pupil*, the *crystalline lens*, and the *retina*, or optic nerve. When objects are placed before the eye, the rays of light reflected from them pierce through the crystalline lens, and gather on the optic nerve, by which the shape, size, colour, &c., of these objects are conveyed to the brain, thus producing the sensation of *sight*.

The *organ* of *hearing* connected with the auditory nerve is the *ear*. Inside the ear is a tube, across the inner end of which a membrane is stretched, called the *drum*. At the back of the drum is a cavity, called the *labyrinth*, from which the auditory nerve proceeds. When sounds are gathered by the ear, they pass down this tube, and strike against the drum, then passing through into the cavity or labyrinth, they excite the auditory nerve, by which they are then conveyed to the brain, thus producing the sensation of *hearing*.

The *organ* of *smell* connected with the olfactory nerve is the *nose*. This is lined by a delicate membrane, supplied with a fluid which keeps its surface wet. On this membrane the fine threads of the olfactory nerve are spread, and when odorous particles of matter come in contact with it the olfactory nerve becomes affected, and by it odours are conveyed to the brain, thus producing the sensation of smell.

The *organ* of *taste* connected with the gustatory nerve is the tongue. This is kept in a moist condition by saliva. The threads of the gustatory nerve are spread over the surface of the tongue, and when these are touched by soluble substances, the nerve becomes excited, and conveys its impressions to the brain, thus producing the sensation of taste.

All these nerves pass through holes in the under part of the skull *to the brain* from their respective organs.

An abundance of information passes to the brain by means of all the nerves of sensation, and in this way it is that we obtain a knowledge of the material world. The *brain* is, therefore, supposed to be the seat of the *mind.*

The *sympathetic nerve.*—The *organs* of the body must act in *unison*, for they all depend upon and work with one another. The *sympathetic nerve* performs this duty. It is so connected with the heart, the lungs, the stomach, the bowels, &c., that it inclines them all to act in perfect harmony.

CONCLUDING REMARKS.

In concluding our lessons on the structure and functions of the human frame, we wish, with the view of more deeply impressing them upon the memory of the reader, to add a few reflections suggested by this interesting subject.

The skill, contrivance, and beneficence displayed by the Creator in the human body may well, indeed, excite our wonder and gratitude. The *structure of the human frame* has been a subject of admiration to all who have even cursorily examined it, and nothing seems better calculated to silence atheism than the labours of the anatomist.

We have already alluded to the wonderful construction of the framework of the body, and we here extend our reflections to other parts of it, especially to the organs of sensation, and the nerves connected with them.

If we take but a cursory view of the senses, we shall find them alike perfect and extraordinary. How happily is the sense of *touch* tempered between two extremes, neither so acute as the membranes of the eye, nor so obtuse as the skin of the heel! The former would expose us to much pain, the latter would quite benumb the body, and almost annihilate touch.

The sense of *sight* is the most perfect and delightful of all our senses. The *eye* is guarded with the most solicitous care, and appears in the brow bright and conspicuous as an evening star. In its elevated position it commands the most enlarged prospects, and conveys to our apprehension the truest colours and exactest lineaments of all the graces of blooming Nature, and all the glories of the visible heavens.

The sense of *hearing* warns us of transactions that pass above, behind, and around us. The ear admits intelligence through the darkest medium and minutest cranny. It is always expanded, always accessible—a courier which never tires, a sentinel ever at his post.

The nerves of the sense of *smell* are so judiciously laid that, being affected by the odoriferous particles wafted by the air, they imbibe all the balmy fragrance of spring, all the aromatic exhalations of autumn, and enable us to banquet even on the invisible dainties of Nature.

The sense of *taste* is circumstanced in a manner peculiarly benign, as it is a standing though silent plea for temperance, because the exercise of sobriety sets the finest edge on its faculties, and adds the most poignant relish to its enjoyments.

Thus the senses are not only so many sources of delight, but a joint security to our health, and in other ways administer to our comfort and happiness.

From these reflections on the senses, and from the description already given of the nervous system, we cannot fail to be struck with the mutual accord, consent, and sympathy of the various parts of the human structure which arise from the positions and curious ramifications of the nerves through the whole body. This is demonstrated most wonderfully by the various aspects of the human *face*. By means of this *communication* of the *nerves with the brain, whatever* affects the soul within is seen by a suitable configuration of the *muscles and parts of the face* without.

The *muscles* of the *face*, besides *acting as agents of power and motion*, are likewise exquisitely adapted for *expressing faithfully* the various *passions and emotions of the mind*; and so truly are these depicted on the human countenance, that even a dog in looking in his master's face easily recognises the silent expression either of commendation or dissatisfaction.

In connection with these remarks, there is another faculty which we must not omit to mention—the wonderful faculty of *speech*. What an admirable instrument for articulating and modifying this great blessing of speech is the *tongue*! By this organ we communicate the secrets of our hearts, make our very thoughts audible, instruct the ignorant, reclaim the vicious, and comfort the distressed.

How striking is the great variety existing throughout the world of men's faces and voices! Had men's faces been cast in stone, the organs of speech in all men would have sounded nearly alike, and the same exact structure of muscles and nerves would have given the hands of all men the same direction in writing.

But now, as it is ordered, every man's face can distinguish him in the light and his voice in the dark; his handwriting can speak for him though absent, and be his witness, and secure his contracts in future generations.

To conclude our reflections, there is another remark of interest not to be forgotten, and that is this:—However perfect all the parts of the human body may be, to act, they must have life. When any one part of importance ceases to act—for instance, if the stomach cannot digest, or if the heart cannot send its nourishment over the body—then life cannot be kept up, and the man dies sooner than he otherwise would. But the question arises, what is life? Life is the cause of the constant changes that are going on in our bodies. Life counteracts gravity, resists the effects of mechanical powers, prevents chemical agency, modifies the power of heat. Thus we know what life does, but what life is we know not.

How poor! how rich! how abject! how august!
How complicate! how wonderful is Man!
How passing wonder He who made him such!
Who centred in our make such strange extremes!—
An heir of glory! a frail child of dust!
Helpless immortal! insect infinite!
A worm! a god! I tremble at myself,
And in myself am lost! at home a stranger,
Thought wanders up and down, surpris'd, aghast,
And wond'ring at her own: how reason reels!
Oh, what a miracle to man is Man!

NOTE.—All young persons desirous of further instruction on 'the Structure and Functions of the Human Frame,' are recommended to read the following excellent little works—*The House I Live in*, by J. C. Girtin, and *Physiology for Schools*, by Mrs. Bray—both published by Messrs. Longman & Co.

ON THE LAWS OF LIFE.

Take Nature's path, and mad opinions leave;
Unerring Nature, still divinely bright—
One clear, unchanged, and universal light.

'LAWS in their most general signification are the necessary relation derived from the nature of things. In this sense all beings have their laws. The Deity has His laws; the material world has its laws; the intelligences superior to man have their laws; the beasts their laws; and, of course, human beings their laws.'

That man is an organised being, and is no exception to the general laws which govern the organised animal and vegetable creation, has been known to the most eminent men and philosophers of all times.

The sages of Greece considered that the Deity had made no other laws for human kind than those which appertain to all organised beings, and that neither vegetables, animals, nor men should be left to *chance* for developement.

Not only the heathen nations, but also the Jewish and Christian, have alike considered the importance of obedience to physical laws. This is obvious from the care which they took in the harmonious development of the body.

The Grecian rules for the preservation of human beauty were not only based on a true knowledge of the proportions of the human frame, but were precisely the best for the support of health, which they properly considered as including physical and intellectual beauty. The consequence was that the human form in Greece was of the finest proportions in the world; hence it is that the remains of their statuary and architecture are inimitable to this hour, and are copied by artists as the most perfect models to be found.

This sense of beauty and harmonious development of the human being was as highly esteemed by the Jews; hence the Old Testament records that no animals were fit for sacrifice but such as were of fine proportions and healthy. Nor could any one officiate as priest who had not the requisite considerations of a good figure and health. The portraits of the Jewish patriarchs are personifications of manly health, vigour, and beauty.

The value of a healthy and perfect organisation in the eyes of the early Christians is well illustrated in their descriptions of Jesus and His disciples.

The Great Architect has thus associated in our minds the comely, the good, the true, and the beautiful; and has given us no reason why we may not cultivate each with the other into harmonious union. The examples we have *gathered from* the Bible show clearly and strongly that neither animals nor men found favour in the sight of God who, by ill-health or unsoundness of body, gave evidence of a violation of His laws.

Both vegetables and animals, as well as man, are subjected, as the very conditions for the integrity of their structure and healthy existence, to particular laws, which are called vital or organic. The term *vital laws* is applied to living beings, and is used to distinguish these laws from the laws of inanimate matter. The term *organic laws* is used also in reference to living beings, and relates to the peculiar construction of their several parts, which are instruments for the performance of special offices or functions.

Now every organ of the human frame is so constituted by the first order of the Creator as to be in particular relation with external bodies, which alike are intended to nourish and preserve it in activity. The stomach, for example, requires food of a certain quality and quantity, so that digestion may be performed properly; the lungs must have air of such temperature and purity as shall not force them to hurried and violent movements in breathing. The eye and ear can bear light and sound of medium intensity if the functions of seeing and hearing are to be executed without pain and inconvenience.

But not *only* is each organ of the human frame impressed in a peculiar manner by external agents, it is moreover affected by the action of the other organs of the same living body of which it forms a part; thus, for instance, the lungs, the organ of respiration, may be made to suffer by cold and moisture applied to the skin; the stomach will be disordered by an injury done to the head, as the head will be pained by a disturbed digestion.

We see then that a necessary connexion and particular relation exist between the organs of the living body and the objects of the external world; and also that there is a mutual dependence among all the organs themselves. This relative connexion and mutual dependence are called the *organic laws*, which can never be infringed without punishment and consequent suffering.

No matter how pure and elevated our intentions, or how philanthropic our actions, we cannot escape the operation of these laws; they are part of the constitution of our nature, ordinances of the Great Creator himself.

All men of sense acknowledge that it is a law of nature that water flows from an upper to a lower situation; that all bodies tend to the earth; that flame ascends towards the sky; that if we ever strain our lungs we suffer in these parts, whether we do it to administer to our vices or to alleviate the distress of others; that want of exercise injures animals and men;

that want of food kills them; and that good form and good health are necessary to make men happy.

To expect the reverse would be to look for a miracle. The fervid preacher of the gospel, the eloquent advocate of liberty, the lawyer, the man of study leaning for hours over his desk, the mariner exposed to the storm, the mechanic bent double in his workshop, are all equally subjected to the *organic laws.*

Some persons are so presumptuous, or so ignorant, as to imagine or hope that there will be some exception in their favour—that the necessity or goodness of their intentions will protect them from the consequences of their breach of these laws—the Creator's laws, which form part of the grand scheme of the universe. But, from experience, we know that however simple may be the omission, however beneficent may be our motive in the omission to observe the laws of nature, the ever-watchful sentinel of life visits the error with proportionate punishment, either of positive pain or of lessened enjoyment. This being the case, it must be acknowledged that it is the duty of all men at all times to strive by obedience to these laws to preserve the body, and thus fulfil the designs of that beneficent Being who gave man life, and who established those laws for man's happiness and well-being.

The question may now be asked, how we are to secure health and a proper development of the body? What is necessary on our part in order to obey these laws?

Health and harmonious development are the constitutional and legitimate product of obeying the laws of every organ of the body and mind. The point is to know that every part of the body is composed of physical elements, and subject to physical laws; and, in applying this knowledge, to adapt the conditions of our position to these laws. Man can, if he will, adapt himself to the laws of life, and every departure from health is but a thermometer which indicates violation of these laws.

1. There must be obedience to the *vital laws*. Food, light, air, and other physical aliment must be supplied in due quantity, and of such a kind as is suited to the constitution.

2. There must be obedience to the *organic laws*, which ordain that all the organs of the body shall be duly exercised. The bones, muscles, nerves, and digestive apparatus, furnish pleasing sensations and appearances when sound, if exercised in conformity with nature.

EXAMPLE OF THE FATAL RESULTS OF IGNORANCE OF THE LAWS OF LIFE.

A gentleman residing in the country, who took great interest in the promotion of industrial institutions for the working classes, resolved to establish an institution of this kind, and to conduct it on his own principles. The labour and anxiety which he underwent at the commencement impaired an excellent constitution, and without perceiving the change, he, by way of setting an example of industry, took to digging with a spade, and actually worked for fourteen days at this occupation, although previously unaccustomed to labour. This produced discharge of blood from the lungs. Being now unfit for bodily exertion, he gave up his whole time to directing and instructing the people, about 250 in number, and for two or three weeks spoke the whole day, the effusion from his lungs continuing. Nature rapidly sunk under this irrational treatment, and at last he sought medical advice. When the structure and uses of his lungs were explained to him, and when it was pointed out that his treatment of them had been as injudicious as if he had thrown lime or dust into his eyes after inflammation, he was struck with the extent and consequences of his ignorance, and exclaimed how greatly he would have been benefited if one month of the five years which he had been forced to spend in a vain attempt at acquiring a mastery over the Latin tongue, had been dedicated to conveying to him information concerning the structure of his body, and the causes which preserve and impair its functions. He *had departed* too widely from the organic laws to admit of an easy return, and his constitution was so grievously impaired that he died after a lingering illness of eleven months. He acknowledged, however, even in his severest pain, that he suffered under a just law. The lungs he saw were of the first importance to life, and their proper treatment was provided for by this tremendous punishment, inflicted for neglecting the conditions requisite to their health. Had he given them rest, and returned to obedience of the organic law at the first intimation of departure from it, the door stood wide open and ready to receive him; but, in utter ignorance, he persevered for weeks in direct opposition to these conditions, till, as the result of his ignorance, he died.

As there is no way so plain but it hath many turnings and by-paths, even so the life of man hath many by-paths to walk in, so that, unless he takes great heed, he will easily wander out of the right way, and, when he has thus wandered, may continue in his course, never suspecting that he is wrong until some affliction may open his eyes to his error; even as a traveller, having mistaken his road, may be set right by a passing wayfarer.

There is an order
Of mortals on the earth, who do become
Old in their youth, and die ere middle age,
Some perishing of pleasure, some of study,
And some of withered or of broken hearts,
For this last is a malady which slays
More than are number'd in the lists of Fate.

ON PHYSICAL EDUCATION.

Physical courage, which despises all danger, will make a man brave in one way; and moral courage will make a man brave in another.

We consider education to be practical training for all the pursuits of life; to be culture, growth, discipline; to be, in short, the developement of the whole man, physically as well as mentally, morally, religiously. A healthy body is the natural state of man, and is the best condition for the developement of a healthy mind. Physical education, therefore, aims at the harmonious developement of all parts of the human body, as a means to health of mind and health of soul. Physical education is one of the most important duties, as no real progress in manners, conduct, grace, or any permanent prosperity or happiness can be predicted on any other basis than sound minds in sound bodies. He that has these has little else to wish for. He that wants either of them, is but little the better for anything else.

It is known that a good physical education fortifies the body, cures many diseases, and gives to the organs a much greater aptitude to execute the movements required by our various wants, besides greater strength and extension of the faculties of the mind, greater equilibrium in the *sensations, and* those just ideas and elevated passions which are connected with habitual sentiment and the regular exercise of a much greater force. Béranger says that 'The first knowledge is that of self-preservation. A severe and masculine education is always the best; it is that only which forms superior men. Of this the history of every age furnishes a multitude of examples.' Another able writer observes that 'Of all those who have great and noble characters, the result of their sentiment and strength, no one would have become famous in the world if his moral education had not been fortified by an excellent physical one.'

As respects physical education in England, it is a matter for serious regret that so little attention has been paid to this subject. We are now only beginning to learn, and that from sad experience, the importance of this branch of education. On every hand we witness the fearful consequence of our neglect of healthy bodily conditions. It is all very well to talk of the comparative few who are able to enjoy the luxuries of riding, boating, hunting, travelling, &c., but alas, the great mass of the people of England have to struggle hard in the battle of life, and have none of these advantages. The consequences are extended most to that numerous and most useful class, who, to gratify a burning zeal for business, engage in avocations which occupy all the powers of the mind, absorb every moment of wakefulness, leaving no time for recreation, for bodily development, for the supply of those fountains of force upon which an over-exercised mentality is a continued and exhausting drain.

This is the obvious tendency of our English youth, shut up in shops, offices, warehouses, banks, &c. Those forces which nature, in harmonious design, intended in building and maintaining the physical form—the groundwork of the individual—are used to manufacture brain fabric, and to support extravagant imaginations. Thus the head absorbs all the juices and real substance of the body. To such an extent is this carried in many instances, that there is no such thing as harmonious proportions. Big heads and small rickety frames, large faculties and slender muscles, lively imaginations and dyspeptic stomachs, are often found in one and the same person. But unfortunately for that person, they were never intended to exist together. Their union is a forced one, they war with each other continually. The life of their possessor is often one of misery, strewed with sorrow and disappointment; yet happily it is of short duration—it is as fleeting as a shadow and as evanescent as a dream.

This inharmony of development, which prevails so universally, may in one sense be considered a disease. It is at least a deformity, and as such demands the attention of all those whose duties involve the practice of the healing art. A harmonious system of physical and mental training is the only remedy that can possibly meet the case.

The ordinary age of man, we are told, is some 'threescore and ten;' but we have abundant proofs that it is easy to attain a much greater number of years. Then how happens it that about one-fourth of the children who are born die within eleven months of life, one-third within twenty-three months, one-half before they reach their eighth year, two-thirds before the thirty-ninth year, and three-fourths before the fifty-first? Of nine children born, only one arrives at the age of seventy-three; of thirty, only one lives to eighty; while of two hundred and ninety-one, only one reaches to ninety.

Statistics are very often fallacious, and, of course, the theories based on them. It has been common to declare that kings and nobles are the most short-lived persons, and the labouring classes those who enjoy length of days. This assertion is contradicted by history and experience. In despite of the habits and manners of many of the aristocracy of past and present times, the instances of longevity are all the other way. The 'Telegraph,' lately commenting on the public health, justly remarks that, 'Throughout England careful observers cannot fail to be struck by the pale, meagre, *worn,* haggard looks of the lower classes of the peasantry, who are crooked and doubled up long before the age at which gentlemen begin to feel the influence of years.'

Many philosophers demonstrate that the nobility of the present day, considered as a class, are far larger and more powerful than their ancestors, enjoy a greater share of health, and display more mental activity and intelligence; whereas the humbler classes, not in towns only, but in most parts of the country, are inferior to their forefathers in dimensions, meaner and uglier in their looks, more poor-spirited in their conduct, and, in the same proportion, short-lived. It is one of the tendencies of our age to glorify and to ignore the advantages of other times. Some centuries ago the people of this country enjoyed more leisure, and were better fed and housed than the same classes are now. No necessity existed for having recourse to artificial stimulants to allure them into out-of-door recreations. They had their archery grounds, their tennis-courts, their bowling-greens, their places for running, wrestling, quoit pitching, and so on, in the vicinity of every large town, and were so fond of these semi-martial exercises, that even the love of money could not lure them from these more favourite indulgences.

It appears then that there is a great necessity for physical reform in England. This country is distinguished for its number of associations for benevolent, intellectual, religious, moral, political, historical, artistical, and agricultural improvement, many of which have succeeded in enlisting the influence and patronage of the Government in their behalf. All these are great, good, and glorious manifestations of power, skill, and philanthropy; but, unfortunately, they are not of the first necessity. While we are achieving such results, we are careless, thoughtless, and neglectful of the very foundation of the utility of such progress, namely, in the structure, beauty, health, vigour, and longevity of man. By this hitherto neglect of the human body, the mind and spirit have been weakened beyond all powers of estimation, and, just in proportion as the physical system has been neglected, so the conscience and the morals of the people have suffered. A correct system of political and Christian education should embrace a proper exercise of the body and intellect, in conjunction with the moral and social sentiments, and nothing but the most partial comprehension of God's laws could have led people of warm hearts and good sense to believe that sound morals and high intellect could be evolved without the full growth, strength, and perfect harmonious development of the human body. Whether properly or improperly formed, the soul has possession of the organs of the body, and can, until divorced from the flesh, work by means of no other; *hence, its* manifestations must, in a great measure, accord with its physical condition. There can be no doubt that personal beauty is representative of moral symmetry. Let us talk as we will of the body as an outward property, it stands nevertheless as 'a picture of the internal being.'

WHAT THE ANCIENTS THOUGHT OF PHYSICAL EDUCATION.

More than two thousand years ago, and centuries before civilisation dawned upon the now enlightened countries of Europe, academies were instituted in Greece, one of the earliest and most ancient republics, for the encouragement of physical training. Into these academies the children of the country were sent at an early age, and subjected to the most hardy exercises possible for them to bear, to fit them to excel in those games for which their country was so celebrated. Rollin informs us that the Greeks, by nature warlike, and equally intent upon forming the bodies and minds of their youth, introduced these exercises in order to prepare the younger sort for the profession of arms, to confirm their health, to render them strong and robust, to inure them to fatigue, and to make them intrepid in all those exercises in which strength of body generally decided the victory.

Lycurgus, the ancient Spartan lawgiver, was well aware of the advantages of physical education. Through his influence the Spartans paid as much attention to the development of the bodies of human beings as the moderns do to the rearing of cattle. They took charge of the fulness of chest, vigour of limb, clearness of eye, and the firmness and looseness of muscle. The consequence was that the Spartans and Lacedemonians produced the ablest and bravest warriors—soldiers inured to the fatigues and trials of life, and well adapted for times of struggles and wars, and ready and willing to defy all aggressors.

Thus we see the ancients seem to have understood, as by instinct, that in order to develop athletic bodies, strong constitutions, and big, round, beautiful muscles, it was necessary to bring into vigorous and continuous activity every part of the physical nature. In short, they seem to have made the great and important discovery, that 'exercise is the law of growth,' and to have applied it successfully to physical development.

Ill fares the land, to hastening ills a prey,
Where wealth accumulates and men decay.

The spleen is seldom felt where Flora reigns;
The low'ring eye, the petulance, the frown,
And sullen sadness that o'ershade, distort,
And mar the face of beauty, when no cause
For such immeasurable woe appears;
These Flora banishes, and gives the fair
Sweet smiles and bloom less transient than her own.

ON HEALTH.

O blessed Health! thou chiefest earthly good
Bestowed by Heaven, but seldom understood.

IT has been well observed by an able writer that, 'in general, good health is essential to the successful pursuit of the business of living.' 'I have,' he remarks, 'a great idea of vigour and elasticity of limb and muscle. Strength for action or endurance; all the internal organs in such thorough condition, that a man never for a moment thinks about them, and is thus fitted, not only for protracted and cheerful physical labour, but more likely to have force of will, large general capacity, a natural inclination towards sound masculine thought, and superiority to indolence, luxury, and debilitating indulgences. It is a miserable thing when life is one long disease, or when some conscious poverty of power, some natural feebleness, or some latent morbid tendency, compels a man to be always thinking about himself, forbids the formation of plans, and restrains from efforts and enterprises which might otherwise be successfully indulged or attempted. Good health is not only important to a man's making the best of life, but may be regarded as included in that best itself. All the parts of the physical structure being sound and good, fitted for their work, and constantly acting in harmony with each other, not only makes the body an efficient and nimble servitor for the soul, but is productive of that buoyant and pleasurable consciousness which attends health, and which of itself makes a man feel it a privilege to live.' 'Health,' says Sir W. Temple, 'is the soul that animates all the enjoyments of life. Without it, a man starves at the most luxurious tables, makes faces at the best and most delicate wines, is poor and wretched in the midst of the greatest treasures and fortunes. With common diseases, strength grows decrepit, youth loses all vigour and beauty, and all its charms; music grows harsh, and conversation disagreeable; palaces are like prisons, honour and attendance are cumbersome, and crowns themselves are burdensome to the monarchs who wear them.' Health is certainly more valuable than money, because it is by health that money is procured; but thousands and millions are of small avail to alleviate the protracted tortures of disease, to repair the injured organs of sense, or resuscitate the powers of digestion. There is this difference between those two temporal blessings, health and money. Money is the most envied, but the least enjoyed; health is the most enjoyed, but the least envied; and this superiority of health is still more obvious, when we reflect that the poorest man would not part with health for money, but that the richest would gladly part with all their money for health. The value of health is rarely thought of, excepting by those who have lost it; yet it is a matter which concerns and demands the attention of all. The careful preservation of health, the acting in such a way that we may possess all our native strength and vigour of body, is clearly a duty incumbent upon all men, not only as respects themselves, but society in general.

In considering what is requisite to constitute health, we may mention—

1. *A certain symmetry and proportion of the outward form*, which is indicative of a symmetry and due proportion of the form and arrangement of the internal organs.

2. Another requisite of health is a *properly balanced developement of the brain*, as the organ of the mental faculties.

3. Health also includes a *perfect freedom from pain or uneasy sensations.*

4. Not only does a healthy condition imply freedom from pain, but it includes *a certain degree of pleasure, and a lively capacity for enjoyment*, generally termed 'good animal spirits.' It would be impossible to state the exact degree of animal spirits essential to a condition of perfect health, but it must obviously be such as to ensure a *cheerful disposition*, *freedom from languor*, *moroseness*, *melancholy or morbid feelings.* A state of health is essentially a state

of *enjoyment*. The simple fact of all the functions of life going on with ease and regularity is of itself a source of pleasurable sensations.

To be a little more exact in our description, health may be considered as *that state or condition in which all the powers and faculties perfectly perform their respective functions*, In health the digestive and nutritive organs convert proper food into appropriate matter for renewing nerve, flesh, muscle, bone; the bowels act regularly and comfortably, the heart circulates the blood with steadiness, regularity, and vigour, carrying warmth and energy to the very extremities of the body; the breathing is slow, regular, and deep, and the lungs transfer from the air to the blood the necessary quantity of the life-preserving principle—oxygen—and throw off the gases injurious to the system. There is a steady, agreeable perspiration, and the skin and other excretory organs carry off all the waste and obnoxious matter from the body; the various limbs move with ease, comfort and power, and considerable exertion can be borne for many hours without much fatigue; the brain is able instantaneously to apprehend the impressions made upon it, and to retain them to periods varying (according to the nature of the impression) from a few days or weeks to the whole lifetime; it is able at any time to revive and apply knowledge long previously acquired, to associate and compare ideas and facts, to form conclusions with quickness, correctness, and precision. All these functions are performed without any sensation, and can be continued for hours without a feeling of exhaustion.

In health the sleep is sound and refreshing, and fatigue both of body and mind is removed by a short rest.

In health the various powers and faculties of the body and mind *increase in strength and vigour* until the *prime of life*, and then *do not decline* until the period of *old age.*

RESULTS OF IGNORANCE OF THE LAWS OF HEALTH.

A city tradesman, having amassed a considerable fortune, determined to retire into the country, there to enjoy the fruit of his labours for the rest of his life. He accordingly selected a neat-looking cottage as his future residence, in one of the most remote districts of England, to which he soon removed his family.

Shortly after their change of residence, the family became constantly subject to illness.

One day an old friend happened to go to a neighbouring town on business, and paid him a visit. In answer to his friend's enquiries, he told him that he was suffering from severe pains in his limbs, which appeared to get worse every day; and that his family had been ill with fever, from which two of his children, a few months before, had died.

The visitor, a thoughtful and intelligent man, who understood the laws of health, having listened with sympathy, expressed himself as not astonished at what he had heard. 'How can you,' said he, 'expect to be free from such complaints in a house like this, surrounded by low marshes, the exhalations from which corrupt the air you breathe? Had you well considered the conditions of health when choosing your new dwelling, all this might have been prevented.'

'Is it possible?' rejoined his friend. 'We never thought of that. The house is rural and pleasant, and we never thought it unhealthy. We have borne these troubles patiently as the affliction of providence.' 'Truly,' replied the visitor, 'we should bear affliction patiently as coming from the hand of God; but you have brought these afflictions on yourself and family by neglecting the study of the laws of health—laws which the Creator has designed for our happiness and preservation. My advice is that you remove at once.'

The visitor soon after left the house. A year or two rolled on, and one morning he received a letter from his friend, stating that he had removed to another, more healthy, part of the country, and that they were then in the enjoyment of excellent health.

CONDITIONS OF HEALTH.

ON FOOD.

In general, mankind, since the improvement of cookery, eat about twice as much as nature requires.

> Some men are born to feast, and not to fight;
> Whose sluggish minds, e'en in fair Honour's field,
> Still on their dinner turn.

Simple diet is best; for many dishes bring many diseases, and rich sauces are worse than even heaping several meats upon each other.

Live not to eat, but eat to live.

If we wish our brain to have the full use of the power bestowed upon it, if we wish to have clear heads, good memories, and cheerful tempers, we must bestow attention upon the food we eat for the support of our bodies. Young people especially are apt to fancy that nothing they eat hurts them. This may be true now in one sense, because they do not at the present moment feel any great evil result from neglect or excess in eating, but middle age or old age suffers for every drain on the vitality of youth.

In future years they will have to pay the debts of indiscretion incurred in youth. Many take liberties with themselves from mere bravado, others because they think it rather a fine thing to treat the body as if it were something beneath their notice, and many more, probably the largest number, from ignorance of the consequences that must ensue from such misconduct.

It is not merely among the young, however, that carelessness prevails in this matter. The community generally bestow but little attention to regimen or the regulation of the dietetic habit. It seems strange indeed that it should be so, when we consider the vast importance of the subject, viewed in its relation to health, and to the support of the human system.

Considering the abuses to which the body is thus constantly subjected, it is wonderful that such a complicated structure, with its arterial system pulsating 4,000 beats an hour, its internal lining, with which everything we eat and drink comes in contact, its nervous system, with such various ramifications, and other equally astonishing organic arrangements, should keep in working order so many years.

> Strange that this harp of thousand strings
> Should keep in tune so long.

In proceeding with our remarks on this subject, we shall speak—1st, of the object for which food is required; and, 2nd, of the kind of food best adapted to secure those requirements, giving as we proceed such general directions as are laid down by the most eminent medical men as the result of their observations and experience.

1. As to the *object* for which food is required. Food is taken into the body for two purposes, namely, *to supply the waste that active organs suffer as a consequence of their exertion, and to furnish fuel that may be burned in the system for the support of the necessary degree of warmth.*

Digestion is the commencement of that process by which food is, by successive mutations, converted into a liquid that is to circulate as a living and vitalizing agent through the animal frame.

In human beings, this process or assimilation comprises the following steps:—The solid food is bruised in the mouth and mixed with the saliva or spittle. It is then swallowed, and conveyed into the stomach, where it is altered into a uniform mass, called *chyme*; from the stomach it passes into the small intestines, where it is mixed with the bile and other fluids, which cause the *chyle* or excrementitious part to separate from it. The chyle is absorbed by the lacteal vessels, and transmitted by them to the veins, mingling in the blood of the veins. The chyle is then passed through the vessels of the lungs, and exposed to the air. The process of assimilation is then complete, and the blood so obtained from the food is fitted to sustain life. Thus we see that from food is elaborated that peculiar nutritive fluid which supplies us with power, and without which disease and death ensue.

All animal and vegetable life are carried on by processes of appropriation and dispersion of elementary matter. The young plant, by its principle of vitality, absorbs from the earth and the surrounding air the elements of its constitution. By this means it grows, and after it has attained its full size, the same process is continued to keep it alive.

Just in the same way the human infant is supported through the various stages of existence, by an appropriation of matter through the food taken into the stomach, and the air taken into the lungs, while at the same time a constant dispersion is going on through the pores of the skin and other outlets provided for the purpose.

Such is the principle upon which the phenomenon of life, in its physical aspects, is conducted.

It is obvious that as there is a continual process of assimilation and dispersion going on both in the infant and adult body, that it is not composed of the same material at one stage of life that it is at another. It is constantly being renewed. The process of assimilation, which is the appropriation of new material, such as food, to displace the old, should be carried on in a natural and healthy manner—that is, it should be done well.

The carrying on of life requires compliance with certain conditions as to diet. So with vegetation; there must be suitable nutriment and a proper temperature. In like manner, a fire can only be kept up by a proper supply of fuel. So food must be taken for the support of human life, of a proper kind, in a proper quantity, and in a proper manner. If this is not the case, the organisation will degenerate, or individual organs will be impaired; and it is to neglect in this matter that the many ills to which the human race is subject are mainly due.

2. As to the *kind* of food best adapted to meet the requirements of the body. Every man, in this matter, must be chiefly guided by his own experience. Appetite, the sense of taste and smell, and instinct, are worth much as guides in selecting suitable nourishment, and little injury would arise from errors of diet if we would only 'Be watchful of the effects of food which we take, avoiding whatever appears to irritate, and eating only that which experience has proved acceptable.'

By attending to this rule, changes in diet have been found of the greatest benefit. In many cases articles of diet which are perfectly wholesome for some persons, are found to produce much discomfort, if not sources of illness to others. The only way to discover these peculiarities is to watch our own sensations. Very often the article least suspected would be found out to be the offending element.

Although instinct thus proves to be a kind and serviceable monitor to man in this as in other matters, it must be remembered that it is by no means an infallible guide to him. It is his appointed destiny to have to reason out much that the less highly endowed animals seem to know by intuition, and hence, he cannot be as safely left as they to the government of his mere impulses. The animals are born with coats on their backs, but ingenious man has to weave and fashion his garments by much contrivance and thought before he can wear them. So in the same way the preservation and due nutrition of animals is entrusted to their natural appetites, while man has to observe and learn many things that relate to these before he is in the condition to maintain the perfect health of his body. Hence we find that, under the suggestions of the unregulated inclination, he commonly makes serious mistakes as to his choice, preferring rather to follow his appetites and the fancies of the moment than to be guided by what is right.

The exercise of our reason and judgment as to the kind of diet we should take is of the utmost importance, especially considering the artificial state of society in which we live. Among uncivilised nations the case is different. They are not at all particular in the choice of their diet, their principal concern being to get something to eat, and the exertion to procure it not only gives a relish, but also a power of digesting any kind or any quantity that chance places in their way. In our case it is indispensable that attention be given both to the kind and quantity of our food. Our power of digestion is less, and therefore only digestible food can be taken, and that in proportion to the amount of exercise that is undergone.

As to the best kind of food to be taken in all cases, no absolute rule can be given. The most we can do is to lay down general principles — principles founded on the laws of chemistry and human physiology, and from which each one may be able to discern for himself what course of living is the best and most conducive to health.

Every kind of food, whether animal or vegetable, that is sufficient in itself for the maintenance of the vital action, must contain both *nutritive or flesh-forming substances* and *combustible or heat-forming substances* in due proportion.

The various organs of the animal economy are composed of four elements, namely, oxygen, hydrogen, nitrogen, and carbon. All foods, therefore, taken into the system, to be nutritious and strengthening, must contain these elements.

The Two Classes of Food.

Such foods as contain the necessary elements —oxygen, hydrogen, nitrogen, and carbon— are provided by the animal and vegetable creation, and they may be divided into two classes, namely, 1st, flesh-forming foods, and 2nd, heat-forming foods.

1. *Flesh-forming foods* comprise all animal foods of every kind (excepting oily and fatty substances), and a few articles of the vegetable kingdom, such as wheat, oatmeal, beans, peas, barley, oats, turnips, rice, potatoes, pears, and apples.

All these foods are composed chiefly of nitrogen. Nitrogen, therefore, contains the nutritive property, and is an important element in forming the fleshy part of our system.

2. *Heat-forming foods* embrace the greater part of the vegetable kingdom, and all fatty and oily substances. All these foods contain carbon, hydrogen, and oxygen, in various proportions. These three elements, therefore, supply heat to the system, carbon being the great feeder of combustion.

Heat-forming foods are called carbonaceous, or combustible, because they contain a large quantity of carbon, and are consumed in the system. They are, in fact, the fuel, from the burning of which we obtain warmth, or animal heat. Now, from what has been said in reference to carbonaceous or heat-forming foods, it will be seen why a person fed exclusively on nitrogenous substances, or flesh-forming foods, is certain to decline. For if food containing no carbon is taken into the system, the lungs draw the carbon from all quarters of the body, till at length the blood is so exhausted of this element, that the fire burns fainter and fainter, less and less heat is given off, digestion is arrested, and when the lungs have consumed the last atom of carbon, the fire is extinguished.

So, on the other hand, a person fed exclusively on carbonaceous substances, or heat-forming food, would decline; for though there would be no falling off in the amount of fuel or animal heat, the blood would be spoiled by an excess of carbon and the absence of salts necessary to its healthy state, and the consequence would be, the prostration of power, or corruption of humour, which would, after a short time, lead to fatal results. Thus, we see the necessity of adopting a *mixed diet*, for giving to the body articles from which it can extract substances similar to those of which its tissues are composed.

The necessity of a mixed diet, and the injudicious policy of restricting the food to an exclusively animal or vegetable regimen, is also gathered from the fact that man is an omnivorous animal, which is indicated by the number and configuration of his teeth.

No one aliment, however rich in flesh-forming principles, be it animal or vegetable, will support life for any length of time. In all cases where persons have been confined to one food, a condition of disease has been induced, succeeded by emaciation and debility, the experiment often terminating by starvation and death.

The great art of nutrition, as far as health and physical development are concerned, depends on a proper variety or mixture of substances eaten for food, and a perfect digestion of what is taken.

It is in the animal world as among men: take for example the horse, whose natural food is grass, but so soon as this useful animal is taken from the pasture, and set to drag heavy loads, it is found that corn must be added to his daily fare. Every muscular effort the horse makes is performed at the expense of a certain waste in his muscular apparatus; consequcntly, the more work he is compelled to do, the greater must be the amount of the plastic or flesh-forming substance furnished to him, or he would be speedily worn out by the effort. So it is with man. A hard-working man requires not merely vegetables, or heat-forming substances, but meat, or flesh-forming substances, to bear the constant waste of muscle which is caused by his labour. Thus a meat diet has the same effect upon a hard-working man that a corn diet has upon a hard-working horse.

Hence we learn that a thorough knowledge of what constitutes the two classes of foods we have mentioned—the flesh-forming and heat-forming foods—is a necessity as far as health is concerned, and therefore, all persons who have the management of a household should possess this knowledge. Yet in selecting the various meats, fruits, and vegetables which are to form the chief meal of the day, how seldom do the persons entrusted with that duty inquire whether the food selected contains those elements necessary to the proper health of the body. It must be remembered that if, in consequence of this neglect or ignorance, such articles are chosen as do not contain the necessary nutritive qualities, the effects produced are often very serious—the blood becomes impoverished, and every organ and function of the body becomes impaired, weakened, or diseased, by the defective state of the blood.

Among the principal *flesh-forming foods*—foods which contain the greatest amount of nutriment, and that are most easily digestible—we may place the following:—Of Farinaceous Foods: 1st, *brown bread*; that is, bread made of wheaten meal, from which the bran has not been separated. 2nd, *oatmeal*. This is much used all over Europe, and properly prepared is excellent food. 3rd. *Rice*, *tapioca*, *sago*. Rice in point of importance may be placed next to bread, and scarcely any other article can be cooked in so great a variety of ways. Indeed, bread may be made of it, besides puddings, porridge, gruel, and custards, and it is an article more easily digestible almost than any other. 4th. *Eggs*, *butter*, *and sugar* may here be noted as containing good nutritive properties. Of Roots and Vegetables: *potatoes*, *beans*, and *peas*; watercresses, lettuce, and onion are good articles of diet. The potato may be ranked with bread and rice. Its place could scarcely be supplied by any other in the vegetable kingdom. When in good condition, and properly cooked, it forms a most excellent food. Of Fruits (raw or stewed, but not dried): the *apple*, *pear*, *orange*, *grape*, or *gooseberry* are the best. The apple may be placed at the head of the list, but all of them are good food, and should be taken as part of the regular meal. Of Meats: *mutton* and *beef* are the best, to which may be added fowl, hare, rabbit, and fish of various kinds.

Among the principal *heat-forming foods*, *fat beef* may be placed first. Most other fatty and oily substances, such as cod-liver oil, also yield great heat to the system. Under this head we may also place oatmeal, and some other similar vegetable substances.

Of foods which contain *both flesh-forming and heat-forming qualities* we may mention:—1st, *milk*, and 2nd, *wheat flour*. Wheat flour approaches most nearly to milk, and to such an extent does it contain the flesh-forming and heat-forming properties, that persons can live for a considerable time on bread and water alone. Each of these articles of diet—milk and wheat flour—may be said to be a perfect food in itself, and therefore they are of the greatest importance.

As to the proportions in which flesh-forming and heat-forming foods should be taken, the following rules should be observed. 1st. Persons engaged in *out-door labour* require a *larger amount of animal food* than those whose occupations are sedentary. 2nd. In a general way, *when no extravagant amount of labour has to be performed*, the flesh-forming and heat-forming compounds of the food should be mingled in about the same proportions that they are found in milk and wheaten breed; that is, the *flesh-forming substance* should be about *one-fourth*, and the *heat-forming substance three-fourths* of the food taken.

These proportions may be found in the following alliances in diet:—*Beef and potatoes, mutton, rice, and potatoes, bread and butter.* The addition of meat to potatoes increases their nutritive or flesh-forming power very much in the same proportion as the addition of butter to bread increases its heat-forming power. In these substances, diet is made to approach towards the composition of milk or wheaten bread, and therefore they contain both the flesh-forming and heat-forming properties. Such a diet possesses the sanction of science, as well as of custom.

Of Drinks.—*Water* is the best and most natural. *Cocoa*, however, is very nutritious, if *pure*; the crushed nibs and the crushed nuts are the most genuine forms in which it can be obtained. Tea and coffee, if used at all, should be made weak, and taken in great moderation.

We conclude this lesson with a few directions, which, in addition to what we have said, may be of general service to the reader:—

1. It may be laid down as a rule, that whatever the mouth relishes the stomach digests; therefore, that which will not bear mixing in the mouth ought not to be mixed in the stomach.

2. Food, to be perfectly wholesome, must be quite sweet and untainted; hence high meats, musty vegetables, live cheese, and sour milk are sources of disease, and should be carefully avoided.

3. No food should be taken but that which is perfectly digestible. The digestibility of food depends to a great extent on its tissue; thus nuts, which are nearly all nourishment, give little to the body, on account of their hardness and indigestibility.

4. The flesh of young animals should never be preferred to that of the older animals. The latter is more nutritious.

5. Dry diet is better for any healthy person than excessive slops, such as soups, &c., which sodden, weaken, and debilitate the stomach, and induce disease.

6. Meals three times a day are sufficient labour for the stomach, prevent gluttony, and keep the body sweet. They should be taken regularly, and about six hours apart. Breakfast may consist of brown bread, butter, eggs, meat, rice, potatoes, milk, cocoa; dinner, of fish or meat, with appropriate vegetables, and fruit or farinaceous pudding; supper, of some light farinaceous food, such as biscuit, sago, &c., and fruit.

7. The less variety of food at any single meal the better; not more than three different articles should be taken. Rather than indulge in a great variety at one meal, the meals should vary, which will form quite variety enough.

8. Luncheons should be avoided, as they break in upon the regular operations carried on in the system, and hinder them by calling to the stomach a part of that bodily power which is required to their successful results. Consequently digestion is hindered and health injured.

9. Desserts are better done without altogether. Whatever articles would properly

constitute a dessert should form part of the regular meal.

10. Drinks should not be taken with food, but some time after it.

11. Breakfast and dinner (especially dinner) should form the principal meals of the day. The bulk of the day's food should be taken in the early part of the day; very little is required after dinner. The stomach should never be overloaded, and especially at night. This is very important.

12. Food should never be of a high temperature. Hot food and hot drinks injure the digestive powers, consequently the whole system suffers from them. Food that is cold is as relishing as hot food when we get accustomed to it.

13. All food should be well cooked, so as to secure mastication, and that the saliva may be thoroughly mixed with the food. Much of the nutritious property in food is destroyed by bad cooking.

14. Care should be taken to avoid all greasy and highly-seasoned food, meat made fibrous by boiling, all pickles, raw vegetables, as beans and peas, hot cakes, new bread, hard dumplings, cold puddings containing flour, rich pastry, confections, and all stimulating drinks, such as spirits, &c.

ILLUSTRATION OF THE FOLLY OF NEGLECTING THE SUBJECT OF FOOD.

In order to apply what we have said in our lessons on food, let us recall an old fable in a new relation—

'We have all heard of the head, legs, and arms quarrelling with the belly, and refusing to support it any longer in idleness. The result of such a course is plain. If the head will not think what is good for it, if the hands will not feed and clothe it, if the legs will not give it needful exercise and fresh air, it will die, but then, head, hands and legs will die too.' Now, this is just the case with regard to food. If you will not use your head to judge what you shall put into your stomach, your hands to work for it, your legs to promote digestion, the poor stomach will suffer, but your head, hands, and legs will suffer with it.

'In former days, when the belly and other parts of the body enjoyed the faculty of speech, and had separate views and designs of their own, each part, it seems, in particular for himself and in the name of the whole, objected to the conduct of the belly, and were resolved to grant him supplies no longer. They said they thought it very hard that he should lead an idle, good-for-nothing life, spending and squandering away upon his own ungodly inside all the fruits of their labour, and that, in short, they were resolved for the future to strike off his allowance, and let him shift for himself as well as he could. The hands protested that they would not lift up a finger to keep him from starving; the mouth wished he might never speak again, if he took in the least bit of nourishment for him as long as he lived; and, says the teeth, may we be rotten if ever we chew a morsel for him for the future. This solemn league and covenant was kept as long as anything of that kind can be kept, which was until each of the rebel members pined away to skin and bone, and could hold out no longer. They then found there was no doing without the belly; and that, as idle and insignificant as he seemed, he contributed as much to the maintenance and welfare of all the other parts as they did to his.'

Food improperly taken not only produces original diseases, but affords those that are already engendered both matter and sustenance.

To be always intending to live a new life, but never to find time to set about it: this is as if a man should put off eating and drinking, and sleeping, from one day and night to another, till he is starved or destroyed.

As the body will faint and decay if it be not from time to time refreshed with bodily food; even so the soul grows weak and feeble towards God, unless it be often and continually nourished with the Word of God, the only food for *the soul.*

ON PURE AIR.

The balmy air around me lends its aid
To freshen my heart's feelings—draughts of health
Come with each breeze, turning the indolence
Sickness had woven round me into life,
And whispering to the renovated soul,
'Strength may be thine—never despair!'

LIFE and health not only depend on a proper supply of food, but also upon a proper supply of *fresh air;* hence, the importance of considering how we can secure a plentiful supply of this valuable element, and by what means we may make it contribute to our health and enjoyment.

Few persons are aware how very necessary pure air is to the preservation of health. We preserve life without food for a considerable time, but if we be kept without air for a very few minutes we die.

Now, it is not enough that we have air; we must have *fresh* air; for the principle by which life is supported is taken from the air during the act of breathing. By the care we take to shut out the external air from our houses, we prevent the escape of the poisoned air, and condemn ourselves to breathe it again and again.

Who that has ever felt the refreshing effects of the morning air, can wonder at the lassitude and disease that follow the continued breathing of the impure air of crowded or ill-ventilated rooms?

To prove how soon, and by what trifling means, impure air may be generated, we have only to go into a bedroom in the morning, soon after the occupant has left his bed, and immediately we shall find our sense of smelling offended by the odour of animal effluvia, with which the room is filled; and these are the effects, notwithstanding that the occupant may be perfectly healthy, and scrupulously cleanly, in his person. If, under such circumstances, the air is rendered impure, how much more injurious it must be when several persons are confined in one room; where, perhaps, domestic affairs are carried on, such as cooking and washing, and where the windows are made not to open, and the door is never opened but while some one is passing through it!

To be sensible of the bad effects of shutting out the pure air, it is only necessary to observe the countenances of those who inhabit close rooms and houses, the pallid hues of their skins, their sunken eyes, and their slow, languid movements.

Besides the contamination of the air through breathing it over and over again, there are other matters which render the air impure;

these are the elements constantly passing off from the surface of animal bodies, the combustion of candles, and other lighted substances. There can be no general excuse for inattention to ventilation on the ground that fresh air cannot be obtained. By the incessant movement of the wind, and by the influence of vegetation, nature provides an ample supply; but it is very doubtful whether the largest portion of the community avail themselves of this blessing; whether they attend to the proper ventilation of their houses, or even attend to ventilation at all. If fresh air were composed of arsenic, a large portion of the people could not have more dread of introducing it into their houses, especially into their sleeping rooms. They have an idea that cold air produces colds; nothing, however, can be more unfounded. Colds are improperly named, for they are fevers, and nothing else. Now, fevers are produced, not by cold air, not by fresh air, but by want of due exercise, a clean skin, and proper ventilation. If fresh air be destructive, as those people imagine, who have not been taught its importance, God would not have provided the means for such an enormous supply. Whatever nature provides in large quantities, she intends for very general use. Among these, water, sunshine, and pure air are pre-eminent.

Persons are generally very particular about drinking dirty water, but not at all about breathing dirty, impure air. Why is this? Simply because water is a fluid which they can see, and air is a fluid which they cannot see. This is, indeed, an exemplification of the old saying, that 'What the eye don't see, the heart don't grieve.' Yet, in reality, impure air is as injurious as impure water. Such persons, however, must be taught to understand distinctly, that there can be no health or vigour while such silly and blamable conduct be pursued, and that it is only by attending to the proper ventilation of their houses that these inestimable blessings can be secured.

A clever physician writing on this subject, remarks that, 'A necessary consequence of bad ventilation in the home is bad morality. In other words, fresh air is not only conducive to health and vigour, but to virtue and religion. For without pure air the richest food cannot nourish, the carbon of the blood cannot burn; consequently impure air induces thinness and coldness of the blood. Coldness of blood creates shivering and discomfort, and then again a craving for something that will light up throughout the body a feeling of warmth. The intoxicating cup readily presents itself, and for the sake of its short-lived, genial glow, many, alas! yield themselves to its fatal spell. So true is it that all efforts to improve the *working* classes must comprehend improvement in the construction of their dwellings, that cleanliness is the handmaid of temperance and religion, and that sanitary reform, conducing alike to elevate the tone of public health and public morality, is not more a philanthropic act than a Christian duty.'

The Atmosphere—Ventilation, &c.

In order that the necessity of this important element of health, pure air, should be fully recognised, it will be necessary to explain the nature of the atmosphere which it is the object of ventilation to admit into the house, while that which is impure should be banished from it.

The word 'ventilation' is derived from the Latin word for 'wind.' Our earth is surrounded by an atmosphere of air, and though we can neither see, nor taste, nor grasp it, yet it is in reality a heavy substance. The atmosphere is considered to be forty-five or fifty miles high, but the heavier part is close to the earth, and it rapidly becomes thinner and lighter in ascending, so much so that people experience great difficulty in breathing on the top of high mountains.

The most important substances of which the atmosphere is composed are these:—

1. Oxygen, a kind of air or gas without colour, taste, or smell. It is so important that, were it withdrawn, we could no longer exist.

without it, we could have neither light nor heat from coal, wood, or substances of the same kind.

2. Nitrogen; a kind of air resembling oxygen in its freedom from taste, colour, and smell, but a lighted candle is instantly extinguished in it, and animals cease to breathe when it alone is inhaled.

3. Carbonic acid, which is colourless, but has a slight smell and a sour taste. There is but a small proportion of carbon in the atmosphere, for this wise reason—that it is poisonous to animals. It is, however, as necessary to vegetable as oxygen is to animal life; if there were no carbonic acid at all, vegetable life would cease.

4. Watery vapour, or the steam, sometimes visible, sometimes invisible, which ascends from all surfaces of water, becomes part of the atmosphere, and is necessary to the life of plants and animals.

Although three of the principal substances of which the atmosphere is composed cannot be breathed alone, without destroying or endangering life, yet so beautifully combined and arranged are they, that the air which is thus formed is one of the most blessed gifts of the Creator. Animal life is so constituted, however, that it is for ever rendering impure and poisonous this fresh and healthy substance.

There is an apparatus within the living man' for blowing away those poison vapours which gather in his frame—the apparatus of breathing, which we will now explain.

We are told that the lungs can contain twenty-two pints of air, though nine and a half pints is as much as is inhaled at a single inspiration. In ordinary and placid breathing, we inhale about *one* pint at an inspiration. Eighteen respirations take place in a minute; it takes, therefore, eighteen pints of air every minute to supply the lungs.

The whole mass of blood in an adult person is about twenty-eight pounds, which is forced, or should be forced, through exercise, by means of the heart, into every part of the body in about two minutes and a half. In this circulatory process it loses its healthy qualities, and changes its colour, and becomes dark or venous blood; and in order to purify it again, *pure air*, through the medium of the lungs, becomes necessary. The dark venous blood is passed and re-passed from the heart, to be purified into vermilion-coloured arterial blood, by contact with fresh air. It is then sent through the arteries to nourish the whole body, distributing its vitality, to be recovered again from fresh air in the lungs. If the pure air necessary for this purpose be denied, disease is generated in the blood, the circulation becomes slower, and life becomes extinct—*bad* and *foul air*, and *death*, are very nearly related to each other.

We now give a few general suggestions as to the means by which pure air can be made most available for the purposes of health.

1. Basement rooms where hard coal is burnt should be frequently ventilated. The impure air should be removed, by allowing the doors to be open frequently, to let in the fresh air. A little care in these matters will tend wonderfully to comfort and enjoyment. People never burn fires without flues or pipes to carry off the smoke, yet they burn gas and lamps, and breathe, for whole hours together, without a thought of carrying off the burnt air or impure breath, and then wonder why they are not healthy.

2. Provision should be specially made for a continual change of air in bedrooms during the night, by the escape of the heated and impure air, and the introduction of cool fresh air. It is a good plan to have an opening in the chimney, near the ceiling, with a chimney-valve fitted into it, to prevent the smoke coming into the room. This will carry off the impure air of the room, which always ascends towards the ceiling.

Pure air may be admitted by placing a sheet of finely-perforated zinc, instead of a pane of glass, in the upper part of the window, farthest from the fireplace, or, if possible, opposite to it. But if these methods cannot be conveniently adopted, the impure air may be made to escape by some opening at the top of the room—such, for example, as boring a few holes through the upper part of the window-frame, sloped downwards, to keep the rain from entering; or, if this be not done, the top sash of the window may be let down an inch or so. Pure air may be admitted by a small opening at or near the floor—such as boring a few holes in the wall, under the window-sill, a few pegs being kept to put in any of them should too much cold air be found to enter; or the bottom part of the sash of the window may be left open a little.

3. Those whose work keeps them indoors the greater part of the day, ought to make it a point of duty to be as much in the open air before or after their work as possible. Another expedient, when the weather permits, is to sit with an open window. The rooms should be kept thoroughly well aired when empty of their occupants.

4. The air we breathe should be *pure* and *cold*. By this means abundant oxygen is supplied to the lungs, muscular energy is increased, the appetite is improved, and digestion invigorated. But very cold air is uncongenial to those who cannot take active exercise, such as persons debilitated by age or sickness, and very young children.

Hot dry air produces muscular weakness, copious perspirations, diminished secretions from the kidneys, frequent thirst, weakened appetite and digestive powers, dislike for bodily as well as mental exertion, sleepiness during the day, and sleeplessness at night. It induces cerebral affections, and other serious diseases.

When air becomes hot and humid, it is still more unhealthy; respiration is more difficult, and the energy of the nervous and muscular system is depressed.

5. The freer the atmosphere is from foreign matter of any kind, whether it be the impure exhalation of a sewer, or the perfume of flowers, the better it is calculated to support life in health, and to conduce to longevity.

Great attention should be paid to the purification of articles of ordinary household use. No vessels containing impure matter should be allowed to remain in the house, as they fill the air with poisonous odour, which, of course, is breathed by the inhabitants. All the bed linen should be properly purified, by allowing the fresh air to blow upon it for a sufficient time. Instead of doing this, a very common practice is, to make the bed soon after the occupant has left it, and then tuck it up, as if with the determination to shut up its impurities to prevent their escape.

6. Morning air, after the sun has in some degree warmed it, is most healthy.

7. Breathing should be through the nostrils, not through the mouth, with regular, slow and deep inspiration and respiration, keeping the

shoulders upright and the head erect. It should never be obstructed either by bedclothes at night, nor by handkerchiefs, &c., worn over the mouth during the day.

INSTANCES OF THE EFFECTS OF IMPURE AIR ON ANIMALS AND MAN.

The value of pure air in connection with the preservation of health is universally acknowledged among intelligent agriculturists. Mr. Youatt, in an essay on this subject, remarks: 'There is one striking fact, showing the injurious effect of heated and poisoned air on the pulmonary system. There are cow-houses in which the heat is intense, and the inmates are often in a state of profuse perspiration. The doors and windows must be sometimes opened, and the wind blows in cold enough upon those who are close to them, and one would naturally think, could not fail to be injurious. No such thing. Those are the very animals that escape; but the others at the farther end, and on whom no wind blows, and where no perspiration is checked, are the first to have inflammation and consumption.'

In proof of our slowness to perceive the effects of the deprivation of air on the human being, we give the following extract from 'Crabbe's Life,' by his son:—'When ten or twelve years of age, Crabbe was sent to a school in Bungay. Soon after his arrival he had a very narrow escape. He and several of his schoolfellows were punished for playing at soldiers, by being put into a large dog-kennel, known by the terrible name of the "Black-hole." George was the first that entered, and, the place being crammed full with offenders, the atmosphere became pestilentially close. The poor boy in vain shrieked that he was about to be suffocated. At last, in despair, he bit the lad next to him violently in the hand. "Crabbe is dying! Crabbe is dying!" roared the sufferer, and at length the sentinel opened the door, and allowed the boys to rush out into the air. "A minute more in the black-hole," said Crabbe, "and I must have died."'

Walpole, in his celebrated letters, thus narrates a memorable instance of brutal ignorance, as regards the subject of air. 'There has been lately,' he says, 'the most shocking scene of murder imaginable. A parcel of drunken constables took it into their heads to put the law in execution against disorderly persons, and so took up every person they met, till they had collected five or six and twenty, all of whom they thrust into St. Martin's round-house, where they kept them all night, with doors and windows closed. The poor creatures, who could not stir or breathe, screamed as long as they had any breath left, begging, at least, for water. One poor wretch said she was worth eighteen-pence, and would gladly give it for a draught of water; but in vain. So well did they keep them there, that in the morning four were found stifled to death, two died soon after, and a dozen more are in a shocking way. In short, it is horrid to think what the poor creatures suffered. Several of them were beggars, who from having no lodging were necessarily found on the street, and others honest labouring women.'

And now behold your tender nurse, the air,
  And common neighbour that aye runs around;
How many pictures and impressions fair
  Within her empty regions are there found,
  Which to your senses dancing do propound;
For what are breath, speech, echoes, music, winds,
But dancings of the air in sundry kinds?

For when you breathe, the air in order moves,
  Now in, now out, in time and measure true;
And when you speak, so well she dancing loves,
  That doubling oft, and oft redoubling new,
  With thousand forms she doth herself endue;
For all the words that from your lips repair,
Are nought but tricks and turnings of the air.

Oh! there is sweetness in the mountain air,
And life, that bloated ease can never hope to share.

Wide flush the fields; the softening air is balm;
Echo the mountains round; the forest smiles;
And every sense and every heart is joy.

ON LIGHT.

Prime cheerer, Light!
Of all material things, the first and best!
Efflux divine! Nature's resplendent robe,
Without whose vesting beauty all were wrapt
In unessential gloom!

NEXT to pure air, *light* is indispensable to health. The operation of light on the animal organism is recognised as urging to exercise, and increasing the beauty and activity of both the bodily and mental powers, while its absence disposes to obesity and sickness. The influence of solar light in permeating the skin, not only produces a salutary influence upon its tissue, but upon the blood; and, through this fluid, upon the whole system. An abundance of light is, therefore, of the greatest importance to health, and is one of nature's remedial agencies. Daylight, like warmth, is not a luxury, but a necessary of life. For the want of it, though it does not produce consequences immediately destructive to life, has a large share in occasioning those derangements of health, which not only tend to shorten life, but render it miserable while it lasts, and which effects are not confined to individuals, but are transmitted from parent to offspring, through successive generations.

The application of these facts, especially in the physical education of the young, must not be lost sight of; indeed, they ought to be of great weight with every one capable of understanding them.

ILLUSTRATIONS OF THE EFFECTS OF LIGHT ON MAN.

It is observed by all that solar light exercises much influence upon the vigour and colour of plants and vegetables. The nutritive process is materially checked in all vegetables and animals when deprived of light for a considerable time. Deprivation of solar influence will prevent the development of animal bodies, and indeed, in numberless instances, produce the most injurious effects both upon the vegetable and animal creation. Plants that are kept in well-lighted rooms have darker and more brilliant colours than those which grow in darkened apartments. So with individuals who labour or live in dark, low, damp, dismal rooms, in narrow, dark streets and lanes, and in dungeons; such persons are all pale and sickly.

Dr. Carpenter, in speaking of the influence of light upon health, observes that 'an annual tendency to bodily deformity exists among children reared in cellars, or mines, or in dark and narrow streets; the body rarely acquires its full development under such circumstances, and the mind cannot attain its full vigour. On the other hand, all travellers have noticed a remarkable freedom from deformity among those nations that wear but little clothing, and, where other circumstances are favourable, it is among such that the body acquires its greatest perfection. It is well known that in many of the deep valleys of the Alps, into which but very little sunlight finds its way, there are large numbers of strangely deformed beings, termed Cretins, most of whom are more or less idiotic; some, indeed, being the most degraded specimens of the human race that it is possible to conceive.'

Doubtless, in this case, other causes are in action besides the want of light; but there seems quite reason enough to believe that it is one of the chief, and probably the most important one of all.

The most satisfactory proof of the influence of light upon human health is, perhaps, that which is derived from the experience of large buildings, in which the condition of the dwellers in different parts is about the same in every particular excepting light. Thus, it has been stated by Sir Andrew Wylie, that the cases of disease on the *dark* side of an extensive barrack at St. Petersburg have been uniformly, for *many* years, in the proportion of three to one, as compared with those on the side exposed to a strong light. And in one of the London hospitals, with a long range of frontage looking nearly due north and south, it has been observed that the patients more rapidly recover on the sunny than on the shady side of the building.

These being the results of the observation and experience of enlightened and eminent men as to the influence of light upon the human frame, the following general suggestions may be made for the guidance of the reader.

1. That all places of labour, and rooms in which persons reside, should be light and cheerful.

2. That bedrooms should be always so situated that the sun may shine into them some time during the day.

3. That light and sunshine should be sought as often as possible unobstructed, constantly taking care only to avoid exposure of the head to the rays of the sun.

Light is the only object of our eye, for our eye was made to see the light; but light is not only in the body of the sun, or moon, or stars, but by beams it doth insinuate itself into all these lower creatures, and presents itself in that great variety of colours wherewith this lower world is beautified. In seeing them we see the light, and delighting in them we take pleasure in the light, from whom they have their gracefulness.

ON CLEANLINESS.

> Even from the body's purity the mind
> Receives a sweetly sympathetic aid.

CLEANLINESS is not only important as an excellent preservative of health, but it deserves to be considered under the three following heads—namely, as it is a mark of politeness, as it produces affection, and as it bears analogy to purity of mind.

First. It is a mark of *politeness*; for it is universally admitted that no one unadorned with this virtue can go into company without giving manifest offence. The different nations of the world are as much distinguished by their cleanliness as by their arts and sciences. The more they are advanced in civilisation, the more they consult this part of politeness.

Second. Cleanliness may be said to be the foster-mother of *affection*. Beauty commonly produces love, but cleanliness preserves it. Age itself is not unamiable while it is preserved clean and unsullied. Like a piece of metal constantly kept smooth and bright, we look on it with more pleasure than on a new vessel that is cankered with rust.

In the third place, cleanliness bears a great analogy to *purity of mind*, and naturally inspires refined sentiments and passions. We find from experience that, through the prevalence of custom, the most vicious actions lose their horror by being made familiar to us. On the contrary, those who live in the neighbourhood of good examples fly from the first appearance of what is shocking; and thus pure and unsullied thoughts are naturally suggested to the mind by those objects that perpetually encompass us, when they are beautiful and elegant in their kind.

In short, personal cleanliness is at once so conducive to health, so essential to social comfort, and so related to purity of mind, that it deserves to be esteemed as one of the first *physical virtues.*

Baths were dedicated by the ancients to the divinities of medicine, strength, and wisdom—Esculapius, Hercules, and Minerva. By the ancient Israelites, the Egyptians and the inhabitants of India, baths were considered as typical of *moral purity*; yet, strangely enough, the civilised nations of Europe have not equalled the less cultivated Hindoos, Persians, Turks, and Russians in the use of the bath, and it is remarkable that the majority of the English people do not use the bath at all.

The women of Eastern nations have skin softer than velvet, through the use of the bath, and their health, as a consequence, is preserved, which their sedentary habits otherwise would destroy. So indispensable is the bath to health and vigour and comfort, that, in England especially, which is subject to so many variations of heat, cold, rains, fogs, frosts, and to such general changeability of temperature, some apparatus for the purposes of bathing should be deemed a positive necessity in every house.

It is well known that there is no aid to health so important as keeping the pores of the skin open, and in a free state.

> For through the small arterial mouths, that pierce
> In endless millions the close-woven skin,
> The baser fluids in a constant stream
> Escape.

Every groom knows that a horse is not in good condition unless his skin is shining and soft, and he spares no pains to effect this object.

The same laws of health that apply to animals in this respect, equally apply to man. The skin is the index of the lungs and of general health. Beauty of complexion is but another name for a clean and healthy skin. There is a constant frothing taking place from the internal organs to the surface of the skin; frequent washing and friction, therefore, become necessary to remove the particles, or internal irregularities and disease will ensue.

We bathe the face and hands daily, and

oftener, and know how comfortable the skin upon these parts feels after the operation. But if this duty be neglected, the skin becomes irritated, it seems stiff and loaded, and we feel disposed to rub it to remove the disagreeable burden. But the other parts, which are not so frequently washed, are not so easily offended. They bear the burden of accumulated excretions and dust with less complaint. But, if they were cleansed as often as the hands and face, they would be equally sensitive, and feel as keenly the comfort of the bath and the discomfort of the neglect of it. But the body with many persons is seldom bathed ; the consequence is, that the skin loses its sensibility, the circulation is unsustained, and the whole body becomes comparatively dull, inactive, and unhealthy.

In those who bathe, the whole skin becomes active, the waste is carried away, they bear heat and cold better than those who only wash the face and hands, and they feel a general lightness and buoyancy running through their frames.

There is probably no more frequent cause of disease than inattention to this practice. When the pores of the skin are obstructed and perspiration is checked, the elements of the transpired fluids will necessarily be thrown upon the system; and, as they are poisonous and injurious if retained, they must be removed by other organs than the skin. These organs are the lungs, kidneys, liver, and intestines; and, when they are called upon to perform the offices that do not properly belong to them, the healthy equilibrium is destroyed, and the oppressed organs will suffer from exhaustion, and become the prey of disease. It cannot be doubted that habits of uncleanliness are the cause of consumption, and other serious diseases of the vital organs; hence the vast importance of the subject in relation to health.

If people wish to be well, and to look well, they must use daily that indispensable necessity, the domestic bath, and any other means by which cleanliness may be promoted.

Methods of Bathing.

> 'Tis Elysium
> In the bath, filled with the sparkling crystal spring
> (Bowered with roses, honeysuckle, and jessamine),
> Chin-high immersed, in blissful ease to lie at length.

In our last lesson we recommended the bath as one of the most effectual means of promoting cleanliness and preserving health. Some directions as to its use may now be given.

We name first the Turkish bath, which during the last few years has been used in England. This bath is found to be very effectual in restoring and improving the health. It is considered to be of great service to those suffering from rheumatic pains and similar ailments of the system. It is administered in several ways, according to the requirements of the patient, and requires, especially for invalids, the supervision of competent persons, such as may be found in the establishments set apart for its use.

The other baths, and which are chiefly used in this country, are the cold, the tepid, the warm, and the hot baths.

When the temperature of the water is seventy-six degrees it is called a *cold* bath; when from eighty-five to ninety-five degrees, a *tepid* bath; when from ninety-five to ninety-eight degrees, a *warm* bath; and when from ninety-eight to a hundred and five degrees, a *hot* bath.

Each possesses its peculiar advantages; and the temperature can be modified to suit the feelings and purposes of the bather.

Dr. Erasmus Wilson, in recommending the *cold* bath, says:—'They who desire to pass the short time of life in good health ought often to use cold bathing, for I can scarce express in words how much benefit may be had by cold baths; for they who use them, although almost spent with old age, have a strong and compact pulse, and a florid colour in their face; they are very active and strong; their appetite and digestion are vigorous; their senses are perfect and exact, and, in one word, they have all their natural actions well performed.'

In speaking of the warm bath, another eminent physician remarks:—'The effect of a *warm* bath to a person in health is highly delightful. The sensations during the process are exquisite, and afterwards no less so. It equalises the circulation of the blood, renders the skin supple and moist, promotes free perspiration, and relieves the body from a layer of thick obstructive accumulation of scurf and other deposits. The flexibility of the joints, the freedom of respiration, the improved tone of nervous feeling in body and mind—memory, thought, and idea being at command after the bath—are notorious truths known to the patron of warm ablution. Warm bathing also acts beneficially on the kidneys and urinary organs; it helps the bowels and stomach and liver, giving new life to each; the action of each being hereby healthily excited, it consequently promotes digestion; and, contrary to the popular fear of a warm bath being weakening, it in reality strengthens the system and fortifies it against cold.'

The *cold* bath should be used every morning, and the whole body thoroughly cleansed; soap should be used, as it is an invaluable agent in purifying the skin.

The impure substances which corrode the pores of the skin are of an oily nature, and impurities adhere to it which must be thoroughly removed. It is found that there is no better way of removing it than by the use of soap.

The time occupied in bathing may extend to *ten* minutes for a healthy person; but the feelings of the bather are generally found a good and sufficient guide.

The brisk and efficient friction of the skin with a coarse towel or flesh-brush should never be omitted after quitting the bath, so that the regular glow may be produced.

Exercise should be taken after the bath, proportionate in quantity to the time spent in bathing.

The *warm* bath should be used for the ablution of the whole body at least twice a week. The afternoon is a very good time for this purpose. The time spent in a warm bath is usually from a quarter to half an hour, unless some special indications require a departure from this rule. The directions given for the cold bath as to the mode of cleansing, exercise, &c., also apply to the warm bath.

When the vital powers are greatest, and the system most free from exhaustion, bathing is most beneficial: hence the morning is preferable to the evening, and the middle of the forenoon to the middle of the afternoon, for this healthful and agreeable duty, as the vital action of the system is more energetic in the early part of the day. It is better to wash with energy on rising, so that the impurities which have collected upon the surface of the skin during the night may be entirely removed.

If ablution be used in the evening, proper friction should be used, so that the new granules, which conform so closely with the extraneous particles of matter, may be allowed to form freely.

In some forms of headaches and nervousness, great benefit may be derived from washing the head well with cold water every morning, allowing a stream of water to run over the top and front of the head for a few minutes, and then well drying it with a coarse towel. The practice should be used with discretion; if the effect be not at once favorable, it should not be persevered in.

The face and the neck should be washed at least twice in twenty-four hours.

If the whole person be not bathed daily, it must be cleansed sufficiently often to keep the body constantly clean, and the blood in vigorous circulation.

Bathing to be efficient should be regular, and should be commenced by degrees, and increased by a process of training.

The time of bathing must not approach or follow too closely a regular meal. This rule is very important.

Though a bath is the most convenient and complete method of carrying out the process of ablution, it may not be within the reach of all. In cases where it is impracticable to use the bath, *a tub, sponge*, soap, fresh water, and a good coarse towel, will serve the purpose efficiently. This should be done, if not every morning or evening, at least two or three times a week, followed by strong friction by means of a coarse towel.

A cold bath, however, every morning or evening, twice or thrice a week, costs but little, takes but little time, and produces an amount of comfort, healthiness, and even self-respect, of which those persons have no idea, who, from want of knowledge, or indolence, or physical debility, have hitherto neglected the practice. The remedy of bathing is what such persons especially need to restore tone to their systems, purity to their skins, and buoyancy to their spirits; and no excuse can be found for neglecting such a remedy, considering that ample convenience for the purpose of bathing is now furnished, especially in populous places, by the establishment of public baths.

OBSERVATIONS ON THE PERSPIRATORY PORES OF THE SKIN, SHOWING THE IMPORTANCE OF CLEANLINESS IN ITS RELATION TO HEALTH.

Dr. Erasmus Wilson informs us, that "on the palm of the hand the number of perspiratory pores is 3,528 in the square inch. Now each of these pores being the aperture of a little tube a quarter of an inch long, it follows that in a square inch of skin on the palm of the hand there exists a length of tube equal to 882 inches, or 73½ feet. On the pulps of the fingers, where the ridges of the sensitive layer of the true skin are somewhat finer than in the palm of the hand, the number of pores in a square inch a little exceeds that of the palm of the hand; and on the heel, where the ridges are coarser, the number of pores in the square inch is 2,268, and the length of the tube 567 inches, or 47 feet. To obtain an estimate of the length of tube of the respiratory system of the whole surface of the body, I think that 2,800 might be taken as a fair average of pores in the square inch, and 700 consequently of the number of inches in length. Now the number of square inches of surface in an adult of ordinary height and bulk, is 2,500; the number of pores, therefore, 7,000,000; and the number of inches of perspiratory tube 1,750,000, that is 145,833 feet, or 48,600 yards, or nearly 28 miles of superficial drainage."

After this description, our young readers have only just to imagine *seven millions* of pores or pipes in the surface of the skin, to be clogged up with dust, &c., thus shutting in all the impurities of the body, that ought to escape through these pores, and they will at once see the importance of cleanliness. Think of *twenty-eight* miles of drainage in the human body being blocked up by uncleanliness! Is it not a wonder that unclean persons have any health at all?

ON CLOTHING.

Dress is not only important as relating to health, but it has a moral effect on the conduct of mankind.

No careful observer of the customs of society in reference to dress can fail to observe the ignorance that prevails as to the real object for which clothing is intended, and to note the sad effects which this ignorance often produces. It will be found that very many of those persons who, more or less, follow the caprices of fashion and pay a scrupulous attention to their outward appearance, pay but little regard to their own personal comfort and health, as far as they are affected by dress. They often become martyrs to fashion, and, as a result, martyrs to disease. Fashion is the talisman for which they struggle, and for which they torture their bodies to an almost incredible degree. The following poetical description of this silly custom admits, we fear, of a very general application:—

They braced my aunt against a board,
  To make her straight and tall;
They laced her up, they starved her down,
  To make her light and small.
They pinched her feet, they singed her hair,
  They screwed it up with pins;
Oh! never mortal suffered more
  In penance for her sins.

Such is the inquisition which the giddy goddess Fashion has established—such the means by which she attains her ends.

The poet Cowper, in looking at this subject in another—an economical—point of view, very truly remarks that,

> We sacrifice to dress, till household joys
> And comforts cease. Dress drains our cellar dry,
> And keeps our larder lean; puts out our fires,
> And introduces hunger, frost, and woe,
> Where peace and hospitality might reign.

It is quite true that outward appearance as to dress contributes much to the art of pleasing others, and, therefore, demands from us some attention; for we cannot help forming some opinion of a man's sense and character from his dress; but that health should be sacrificed to a mere love of dress is so unreasonable, that surely no one who has any regard for their own comfort and convenience, no one of sense or reflection, would continue to tolerate such a practice.

We now come to remark on the immediate object of this lesson—the importance of clothing considered in its relation to health.

Our habits of dress have so much to do with health, that it would be the height of folly to expect freedom from disease where no attention is given to the subject.

The utility of clothing consists in its protec*tion of* the body against cold, wet, or damp.

Wet and damp are only different modes of applying cold; but their agency is more deleterious generally than a dry, freezing cold, because they relax the frame and render it more susceptible of lowering impressions. The effects of cold on the human frame are very capricious. We shrink from casual exposure to rain, drafts of air, or wet feet; and instances are constantly occurring wherein the neglect of these precautions, together with a want of exercise and inattention to cleansing the skin, have produced depressions of the nervous power and circulation, sometimes the very re-action ending in death. In other instances, it seems as if the frame were iron, and quite impassive to cold, neither lowered by it nor re-acting. In such it will generally be found that the skin is clear and clean, and that plenty of exercise is taken.

The following general directions as to dress are of importance, and therefore demand attention.

1. The materials used in the manufacture of apparel for winter should be *bad conductors of heat*; that is, they should have little tendency to conduct or remove heat from the body. Furs, woollen cloths, and silk have this property, and should, therefore, be adopted as the materials for winter garments. In the summer, especially when the weather is very warm, such garments should be worn as are *good conductors of heat*. Cotton and linen are of this cha-

racter, and are therefore suitable for summer wear.

2. Materials for clothing generally should be as destitute as possible of the property of absorbing and retaining moisture, for the following reasons:—1. Moisture renders apparel a good conductor of heat; hence damp clothing should never be worn, as it retains less heat than dry clothing. 2. If the perspired fluid and the saline material it holds in solution are readily absorbed by the clothing, they become sources of irritation to the skin with which the apparel comes in contact.

Cotton is by far the best material to wear next to the skin. For children, healthy people, and even for invalids, no substitute can supply its place. Flannel is too exciting, and produces an extra amount of heat, renders the skin more delicate, and doubly susceptible to changes of the atmosphere.

3. The forms and material of dress should always be made rigidly subservient to the laws of health. No garment should ever be allowed to interfere with the entire freedom of locomotion, or with the natural actions of the bodily organs, or with the perfect circulation of the blood; hence, great care should be taken to avoid tight hats and cravats, as they produce headaches, and other nervous difficulties. Tight garters, tight shoes and boots, *interrupt* the circulation of the blood, and

prevent the free use of the muscles. Tight lacing is most dangerous, as it hinders the full expansion of the lungs, and the free play of the heart and muscles. It presses down the liver, stomach, and bowels; and, in this way, brings on dyspepsia, consumption, and a long train of evils too numerous to detail. Thin shoes should be avoided, especially by females, in wet weather.

4. The underclothing should be changed every two or three days, as it speedily becomes saturated with perspiration. The outer clothing should not be worn long without changing, as it also becomes charged with the refuse matter of the body.

EXAMPLE OF THE FATAL RESULTS OF DISREGARDING THE USE OF CLOTHING.

One winter evening, a young man was induced by a friend to attend a place of amusement. The hall was thronged with spectators, and being badly ventilated was filled with impure air.

When the young man left the hall, instead of previously wrapping himself up with additional clothing, he went out of the heated and foul atmosphere into the street. The weather, for which his clothing and boots were unsuitable, was very cold and wet, and he had some distance to walk. On his arrival at home, he felt symptoms of a severe cold, but instead of immediately taking some means of cure, he retired at once to bed. The next morning he rose at his usual hour and began his work. During the day his cold got worse, but in the evening, contrary to the advice of his family, he took a journey by railway to keep a business engagement. On his return, he became much worse. On the following morning his throat was sore, and he could scarcely speak, but nevertheless he got up and went to business. In the course of the day a medical man happened to call, and was so struck with the young man's dangerous condition, that he recommended him to send at once for the family doctor. He at last consented; but it was too late. The doctor came, and found that his throat was ulcerated. He was ordered to bed, and all means were tried for his recovery, but in vain. He gradually declined, and in a few days died, deservedly regretted by his family and friends. Here, then, we have a striking instance of the premature death of a young robust man, simply through an act of imprudence in disregarding an important condition of health. Had he taken proper precaution at first, and provided himself with clothing suited to the season, and carefully wrapped himself up on leaving the hall of amusement, and thus avoided catching cold, he might have lived a useful and happy life, enjoying its blessings even to old age.

ON LABOUR.

Man hath his daily work of body or of mind
Appointed, which declares his dignity,
And the regard of Heaven on all his ways.

Bodily labour is of two kinds, either that which a man submits to for his livelihood, or that which he undergoes for his pleasure. The latter of them generally changes the name of labour for that of exercise, but differs only from ordinary labour as it arises from another motive.

A general idea of the human body, without considering it in the niceties of anatomy, lets us see how absolutely necessary labour is for the right preservation of it. There must be frequent motions and agitations, to mix, digest, and separate the juices contained in it, as well as to clear and cleanse that infinitude of pipes and strainers of which it is composed, and to give its solid parts a more firm and lasting tone. Labour ferments the humours, casts them into their proper channels, throws off redundancies, and helps nature in those secret distributions, without which the body cannot subsist in its vigour, nor the soul act with cheerfulness.

We might here mention the effect which this has upon all the faculties of the mind, by keeping the understanding clear, the imagination untroubled, and refining those spirits that are necessary for the proper exertion of our intellectual faculties, during the present laws of union between body and soul. It is to a neglect in this particular that we must ascribe a great number of the diseases so prevalent among mankind.

Had not labour been absolutely necessary for our well-being, nature would not have made the body so proper for it, by giving such an activity to the limbs and such a pliancy to every part as necessarily produce those compressions, extensions, contortions, dilatations, and all other kinds of motions that are necessary for the preservation of such a system. And that we might not want inducements to engage us in such labour as is proper for the welfare of the body, it is so ordered that nothing valuable can be procured without labour. Not to mention riches and honour, even food and raiment are not to be come at without the toil of the hands and sweat of the brow. Providence furnishes materials, but expects that we should work them up ourselves. The earth must be laboured before it gives its increase, and when it is forced into its several products, how many hands must they pass through before they are fit for use! Manufactures, trade, and agriculture, naturally employ more than nineteen parts of the species in twenty; and it is to the laborious exertions of the men engaged in these branches of industry that we trace the prosperity and greatness of the commerce of our country.

> Come hither, ye that press your beds of down,
> And sleep not: see him sweating o'er his bread
> Before he eats it. 'Tis the primal curse,
> But soften'd into mercy; made the pledge
> Of cheerful days, and nights without a groan.

As for those who are not obliged to labour by the condition in which they are born, they are more miserable than the rest of mankind, unless they indulge themselves in that voluntary labour which goes by the name of exercise.

Labour is a duty which we owe to ourselves and society; without activity there can be no happiness, and without labour neither individuals nor society can prosper. Labour is always praiseworthy. Common degrees of it, however, are not always praised: it is generally considered as its own reward, its natural effects being health, competency, and convenience.

The motives to it, therefore, are so powerful, and so obvious to every person of sense, that in complying with them there can be no extraordinary merit. Idleness being, in like manner, its own punishment, and generally accompanied with want, disease, and contempt, renders the idle man an object of pity, as well as of disapprobation.

Having thus far spoken generally of the necessity and advantages of labour, we now proceed more particularly to show from well-established facts how labour promotes bodily health.

It is well known that all professions and occupations in which very little muscular effort is required are far less healthy than those of a more laborious kind. Thus we find, from an article in the *British and Foreign Medical Review*, founded on the tables of an institution for sick mechanics, that of 10,000 coopers, thatchers, sailors, brewers, blacksmiths, stone-cutters, masons, millers, carpenters, wheel-wrights, butchers, nailers, and slaters, 2,133 were taken sick, and 67 died; while, on the contrary, of 10,000 glovers, lace-makers, brush-makers, confectioners, hairdressers, goldsmiths, shopkeepers, furriers, tailors, shoemakers, tapsters, watchmakers, gilders, pewterers, dyers, bookbinders, and surgeons, 2,371 sickened and 101 died. Thus it appears in the former case, in which muscular labour was required to a great extent, 67 died out of 10,000, while in the latter case, in which very little labour or muscular effort was wanting, 101 died out of 10,000. These facts prove that a sedentary *life* and want of muscular exertion are inimical *to health.*

The following directions as to labour generally will be found worthy of the attentive consideration of all, especially of the young, who have life before them, and who have yet an occupation to choose:—

1. Labour should always be of such a kind as to agree with the health. It is nothing less than self-destruction to continue in an occupation which you know, or have good reason for believing, lessens your health, and thus shortens your life.

2. The amount of labour of course depends greatly on circumstances, varying according to the nature of the employment, whether bodily or mental, whether severe or light, &c. It should be limited so as to allow opportunity for the purpose of digestion of food, and other bodily necessities, and for general mental and moral culture.

3. Labour should be performed with determination and cheerfulness, and as conscientiously as any other duty.

4. Proper care should be taken to avoid over-exertion, internal strains, excitement, confinement, &c.

5. It should be commenced in the early part of the day, and not extended to late at night; certainly not after ten o'clock, proper intervals being had for rest, &c.

* * *

LIVES OF GREAT MEN A TESTIMONY TO THE NECESSITY AND IMPORTANCE OF LABOUR.

Hugh Miller, than whom none knew better the strength and the weakness belonging to the lot of labour, stated the result of his experience to be that work, even the hardest, is full of pleasure and materials for self-improvement. He held honest labour to be the best of teachers, and that the school of toil is the noblest of schools—save only the Christian one—that it is a school in which the ability of being useful is imparted, the spirit of independence learnt, and the habit of persevering effort acquired. He was even of opinion that the training of the mechanic—by the exercise which it gives to his observant faculties from his daily dealing with things actual and practical, and the close experience of life which he acquires—better fits him for picking his way along the journey of life, and is more favourable to his growth as a man, emphatically speaking, than the training afforded by any other condition.

The array of great names, of men springing from the ranks of the industrial classes, who have achieved distinction in various walks of life—in science, commerce, literature, and art—shows, by the difficulties and toils they endured, that greatness and distinction are only obtained by honest, persevering, laborious exertion.

LABOUR IS NOBLE AND HOLY.

Hark, how creation's deep musical chorus
Unintermitting goes up into heaven!
Never the ocean wave falters in flowing,
Never the little seed stops in its growing;
More and more richly the rose-heart keeps glowing,
Till from its nourishing stem it is riven!

Labour is life; 'tis the still water faileth;
Idleness ever despaireth, bewaileth;
Keep the watch wound, for the dark rust assaileth;
Flowers droop and die in the stillness of noon.
Labour is *glory*; the *flying* cloud lightens;
Only the *waving* wing changes and brightens;
Idle hearts only the dark future frightens:
Play the sweet keys would'st thou keep them in tune.

Labour is worship! the robin is singing—
Labour is worship! the wild bee is ringing;
Listen! that eloquent whisper upspringing,
Speaks to thy soul from out nature's heart:

Work! and pure slumbers shall wait on thy pillow;
Work! thou shalt ride over care's coming billow;
Lie not down wearied 'neath woe's weeping willow—
Work with a stout heart and resolute will!
Work for some good, be it ever so slowly;
Cherish some flower, be it ever so lowly:
Labour! ALL LABOUR IS NOBLE AND HOLY!

The wise and active conquer difficulties
By daring to attempt them; sloth and folly
Shiver and shrink at sight of toil and hazard,
And make the impossibility they fear.

Absence of occupation is not rest:
A mind quite vacant is a mind distressed.

ON EXERCISE.

Exercise is the awakener of dozing nature, the solace of the limbs, the healer of diseases, the chaser of vices, and the medicine of listlessness.

The sedentary stretch their lazy length
When custom bids, but no refreshment find,
For none they need: the languid eye, the cheek
Deserted of its bloom, the flaccid, shrunk,
And wither'd muscle, and the vapid soul,
Reproach their owner with that love of rest
To which he forfeits e'en the rest he loves.

Bodily exertion, as we have already stated, is of two kinds, either that which a man is compelled to undergo for a livelihood, which is generally termed labour, or that which he voluntarily undertakes for his pleasure or his health, which goes by the name of exercise. It is of the latter that we are now about to speak.

It has been well observed by Rousseau, that 'If you wish to develope the mind of a pupil, you must develope the power which that mind has to govern; you must exercise his body, and thus make him healthy and strong, that you may make him prudent and reasonable.'

The ancients appear to have understood far better than the moderns the truth contained *in these* remarks, for we find that among the

Greeks and Romans children were not considered well educated unless they had followed the regular course at the gymnasium. We need not enter here into details of the gymnasia at Greece, but merely say that the application of gymnastics to the perfection of man's physical nature, and to the treatment of many diseases, may be traced to the remotest antiquity.

It cannot be too often repeated, that everything tends to prove that man was destined to lead an active physical life. The Divine injunction was not that man shall live by the exercise of his brain, but by the *sweat of his brow*—by his hardihood.

Every part of the organised frame has been made for use, and therefore, unless every part is properly used, the purposes of the organisation are wasted, and the balance of its economy is deranged.

The mode in which exercise operates is very simple. Motion of any animate or inanimate body cannot be effected without the expenditure of force. The voluntary movement of an organ or member of the body creates a want of moving power, by exhausting the condition upon which alone motion is rendered possible. Hence this want amounts to the same thing as a demand on the fountains of life. The supply of this demand is a continual stimulus to the vital forces. An increase of circulation is thus induced, arterial blood is supplied with new vigour, molecular change is more rapid and perpetual, the vital processes of nutrition, secretion, excretion, &c. are augmented, and parts once weak and useless are rendered strong and vigorous. Hence, we find that exercise produces its diffusive or remedial effects by inducing contraction and relaxation of those tissues which possess the power of contractibility, and this principle is involved in those special exercises particularly adapted for sedentary people and unhealthy trades, where a portion of the limbs are daily dormant, and where respiration, digestion, and all the vital functions are impeded.

Now, if exercise be not taken, the purposes of the organisation, as we have said, are thwarted. The secretions intended to supply the waste which exercise produces become sluggish, something is kept back in the system which ought to be thrown off by the skin, in the form of perspiration. Now, experiments have proved that a person of middle stature and in perfect health throws off by insensible perspiration from three to five pounds weight in twenty-four hours, when proper exercise is taken, but not otherwise. When exercise is not taken, a great part of the matter is retained in the body, which tends to corrupt the fluids, obstruct the vessels, and oppress the whole system. The health and vigour of all parts of the body depend on perpetual absorption and renovation; and exercise, by at once promoting absorption and secretion, invigorates life, renovates all the organs, and preserves them fit and apt for every office they have to perform. It also contributes to the circulation of the blood, and insures its imbibing the salubrious influences of the atmosphere, which forms so essential a part of our physical well-being.

The circulation of the blood can only be properly carried on through the medium of exercise or labour. The hilarity and vigour of health which we feel and enjoy in an active course of life, the zest in appetite and refreshment after food, is wholly owing to new blood prepared every day from properly digested food, and distributed by the joint action of all the organs of the body.

The quantity of blood in an average-sized adult may be taken at about four gallons, the complete circulation of which is effected in three hundred contractions of the heart. The blood of the pedestrian, whose speed amounts to five miles an hour, is completely purified and circulated every two minutes, while during moderate exercise this time is extended to two minutes and a half, and when the body is in a passive state to about four minutes.

From these facts, we see that perspiration cannot be kept up to the full requirements of the system unless the movement of the blood is quickened by muscular exertion from time to time by means of exercise.

The special organs of animal life, the muscles and nervous structures, require to be steadily and regularly exercised on their own account. The muscles have their substance used up whilst they are being employed in vigorous contraction, but in intervals of rest they will grow, enlarging by an excess of gain over loss, because blood is circulating through them, out of which they may appropriate the material of muscular tissue; so that it will not be only whilst we are taking exercise that we shall be equalising the circulation, but we shall live through the day and sleep through the night under this prime condition of comfort and health, while we shall be growing more fit for greater exertion. The exercise which fatigued at first, will not be enough to satisfy us as we get stronger and larger muscles.

Exercise is also important considered in its relation to the mind. The senses and various faculties must be systematically employed, in order that they may be kept in a state of buoyant readiness for their own peculiar work.

As health is the result of the balanced and well-regulated activity of the various organs of the body, so is happiness the result of the balanced and well-regulated activity of the various faculties of the mind.

The conclusion, then, at which we arrive as the result of the preceding remarks, is that *exercise* is absolutely necessary to the healthy condition both of the body and the mind. It is necessary to the healthy that they may retain health, and to the sickly that they may the more quickly recover their health.

Now, when we consider the immense importance of nerve and energy, especially to those who have to encounter those difficulties which the majority have to encounter in business in the early part of their career, we shall at once see the indispensable necessity of exercise to such persons; and yet we find a general carelessness exists among them on the subject.

Is it not a sin and a shame to see merchants, lawyers, students, clerks, and the sedentary classes generally, who are confined to offices, desks, books, shops, from morning until night, scarcely going out of doors except to or from business, and then riding on omnibuses? If the laws of life were better understood or cared for, not one-third of those vehicles would be required. It is for want of proper exercise that hundreds break down or remain at the foot of the ladder, while others who pay a scrupulous attention to exercise and health, but who may be far less worthy in their character, less competent in mental attainments, or even knowledge of business, become men of wealth and importance.

Viewed in relation to the young, who have not yet entered on the business of life, this subject is of special interest.

Children, like all young animals, have a natural disposition towards bodily exertion. They frisk and bound in a thousand gamesome ways, and indulge their sportive humour with almost everything. Their noisy play springs from their exuberant spirits, which are given them for their enjoyment, and to supply motives for the requisite practice and strengthening of their limbs, their body, and their lungs.

Their games are well adapted, when they have places for their indulgence, as first lessons to learn the use of their physical condition. Their frame is light, and they have to carry it about to exercise their legs, rendering them by use secure and ready instruments of locomotion. Their perpetual falls only show that they are but learning how to walk, run, jump, and lift. The games of their age, therefore, are running, hoop, ball, marbles, leap-frog, &c. Every mother should be convinced that her children ought as naturally to be skipping and bounding about as breathing; and if they wish their boys to be healthy, they should accustom them to face and bravely meet a bracing wind and the cold of winter by running upon the snow, gliding on the ice, throwing balls, quoits, and taking every kind of exercise that will tend to develope every separate muscle and joint, and *also call into* play the social and moral feelings;

for, all other things being equal, the boy who excels in games and feats of strength and skill, is most likely to excel in more important ways in manhood.

As respects the physical education of girls, there is a want of the necessary appliances. Academies under scientific and practical instructors are much wanted. Most female ailments arise from ignorant management. Such academies would demonstrate to parents how useful a variety of exercise is in adding to the symmetry of form, and lighting up and invigorating the life by which that form is animated.

It is too much the practice that while boys are allowed to pursue the sports of their advancing age, their sisters, whose bodily strength requires exercise equal in proportion to their natures, are forbidden its enjoyment. They are to be trained to artificial feminineness of mind, manners, and accomplishments. The consequence of this delicacy and fragility are plainly enough to be seen around us. Nature, however, protests against a violation of her laws, and will soon proclaim her rights, if it be thought unladylike to be active, healthy, and full of bounding emotions.

We would, therefore, counsel all parents who wish their daughters to be healthy and long-lived, to ascertain the best exercises for developing the joints and muscles, how to expand the chest, to bring down the shoulders, to make the form erect, to give grace to motion, to give a light elastic step in walking, to restore the distorted or weakened members of the body. These exercises, they may rest assured, will contribute to domestic happiness; for good temper, and many other desirable mental and social qualities, are consequent upon health.

Directions for Exercise.

Having in our last lesson shown the importance of exercise in its relation to health, we now proceed to give a few general directions on the subject.

1. Among the best methods of bodily exercise, the gymnastic art claims foremost attention.

Gymnastics consist in regulating the voluntary motions of the body, and giving them more strength and precision. This art embraces the practice of all exercises tending to render men more courageous, intrepid, and active; it enables them to overcome difficulties, in order to preserve health and to re-establish it.

Gymnastics establish the equilibrium of the different parts of the weak muscles, and conduce to the repose of those which are too much developed. It is an art which, by regulating exercise, contributes to the regular growth of the body, its perfection, strength, and beauty.

Gymnastics are useful in all professions as an instrument for becoming dexterous in every undertaking.

Dr. Roth observes that 'Gymnastic exercises produce, at the instant bidding of the will, such an effect on the muscles, that they are brought into prompt and rapid action. The combination of muscular force, flexibility, and prompt obedience to the will, give to the body the pleasing and graceful appearance of firmness, steadiness, and dexterity in the position and use of the limbs;' and Hoffman informs us that he has 'made people who were naturally stupid comparatively intelligent, by prevailing on them to take gymnastic exercises.'

2. Important as gymnastics are as a means of exercise, we need not confine ourselves to them. There are other kinds of exercise which are very effectual, and perhaps more generally available. Walking is a fine exercise, so is riding on horseback, but the latter is ordinarily too expensive, and it is always better to avoid it if walking can be undertaken. The cultivation of the soil in one's own garden by digging, is, although a homely practice, very beneficial as an exercise. Among other kinds of bodily exertion, we may mention swimming, skating, rowing, and cricket, which, if practised in moderation, also afford most exhilarating and healthful exercises.

It should, however, be mentioned that whatever kind of exercise be used, it must be such as brings into action all the limbs, expands the chest, and gives free play to the lungs.

3. In order to obtain the full advantage of the nervous stimulus, that powerful agent created by exercise, we must, while exercising, feel that our object is to benefit our health; and we should take an interest in what we are doing. For example, this interest may easily be excited by taking a walk towards a place we are anxious to reach, contriving on our way to do an errand, to call on a friend, to visit some interesting scenery, to pick up some minerals, or to gather some botanical specimens—so diverting our mind by whatever we may chance to see. Exercise will then prove beneficial; when, if performed without an object, without interest, and languidly, it will prove ineffectual.

> The man who consecrates his powers,
> By vigorous effort and an honest aim,
> At once he draws the sting of life:
> He walks with nature, and her paths are peace.

4. How much exercise particular individuals should take depends on circumstances, to be determined by the person himself, and varies with the capabilities of endurance, which are discovered by the feelings at the time. As unperverted appetite constitutes an infallible guide to the required quantity of food, so muscular appetite, if we are in a healthy condition, will inform us how much exercise we require

for the time being, and when we are taking it in excess. From two to six hours of vigorous muscular exercise per day is the estimated amount compatible with first-rate health. A lower degree of health may be preserved on less exercise, but certainly requires a few hours daily. As a general rule, exercise should be sufficient daily to excite the skin to the healthy action of perspiration, and to produce a feeling of lightness and cheerfulness throughout the frame, and a good appetite.

5. Exercise should be taken in the fresh open air. Should circumstances prevent it being taken out of doors, the windows of the apartment, during the period of exercise, should be thrown open to admit of plenty of fresh air.

6. It should be undertaken gradually, otherwise the usual effects of over-exercise will follow. Men who are about to perform athletic feats undergo exertion gradually; they undertake more and more every day until the requisite degree of strength is acquired. So it should be with ordinary exercise. It must be remembered, however, that exercise is not to be furious—it may be carried too far.

7. The proper time for taking exercise is the early part of the day. Much exercise should not be taken before breakfast without first taking some refreshment. It should never be taken immediately before or after a meal, espe-

cially a full meal, such as dinner. Regularity as to the time of exercising should be strictly observed.

8. The waste occasioned by exercise must be duly replaced by food. It would seem to be a dictate of reason that there should be a correspondence between the quantity of food taken and exercise. If there be any deficiency of food, the blood will soon cease to give that invigorating influence to the parts upon which increased strength and health depend.

INSTANCES OF THE EFFECTS OF EXERCISE ON HEALTH.

There are few distinguished men of any age or country who have not indulged in a great amount of exercise while young, and thus laid in a stock of vitality for future years, or else made up in after life for the misfortunes of their youth. Cicero is described by Plutarch as being, at one period of his life, extremely thin and slender, having such a weakness in his stomach that he could eat but little, and that not till late in the evening. He travelled to Athens for the recovery of his health, where his body was so strengthened by gymnastic exercises as to become firm and robust, and his voice, which had been harsh, was thoroughly formed, and rendered sweet, full, and sonorous.

Julius Cæsar, too, was originally of a slender habit of body, was troubled with pains in the head, and was subject to epilepsy; but, influenced by the example of Cicero and other contemporaries, he found in exercise the best medicine for his indisposition, as, afterwards, he went through long marches, fared on coarse diet, frequently sleeping in the fields, and continued for years exposed to all the hardships of laborious wars.

Many others among the old Roman and Grecian orators took a great amount of exercise in order to prepare themselves for public speaking; for the ancients knew that no one can have a good voice without having a good muscular system.

The following extract from the 'Castle of Health,' by Sir Thomas Eliot, an eminent physician of the reign of Henry VII., will show the importance attached to exercise, rightly taken, in his days:

'Loud reading, counterfeit battle, tennis or throwing the ball, running, walking, added to shooting, which, in mine opinion, exceeds all the others, do exercise the body commodiously. Alway remember that the end of violent exercise is difficulty of fetching the breath; of moderate exercise, alteration of the breath only, or the beginning of sweat. Moreover, in winter, running and wrestling is convenient; in summer, wrestling a little, but not running; in very cold weather, much walking; in hot weather, rest is more expedient. They which seem to have moist bodies, and live in idleness, have need of violent exercise. They which are lean and choleric, must walk softly, and exercise themselves very temperately.'

To these examples might be added the names of many other men of genius who have worked hard either at manual labour or at special exercises. Christopher North excelled in all rural sports, and was also known as being an excellent gymnast. Shakespeare, while composing his immortal plays, is said to have carried bricks and mortar to build places for their performance. John Wesley took laborious exercise, and was a great walker. Elihu Burritt, the learned blacksmith, worked daily eight hours at the anvil. Sir Walter Scott, after confining himself several days to his desk, would mount his horse, call out his dogs, and follow the chase for days in succession, till he had restored his prostrated energies, and then return to his study. Byron, in his young days, took extremely severe exercise and lived an abstemious life, to increase his personal beauty. Daniel Webster was inured to severe labour, and took much daily exercise in later life. Franklin was a hard-working printer. Washington was a farmer and a ploughman, and worked as hard as any one upon his farm.

With such examples before us, who would *not* be animated to take exercise? It is absurd *to imagine* that a due attention to exercise requires too much time, and is inconsistent with any situation in life. Exercise is a medicine which prevents disease. On its due performance the amount of happiness or misery experienced by every individual rests.

We conclude this lesson by quoting the words of an observant American female, who appears to have fully appreciated the importance of the subject :—

I recollect the time when I
Rode father's horse to mill,
Across the meadow, rock, and field,
And up and down the hill ;
And when 'our folks' were out at work
(It never made me thinner),
I jumped upon a horse, bare back,
And carried them their dinner.

Dear me ! young ladies now-a-days
Would almost faint away
To think of riding all alone
In waggon, chaise, or sleigh ;
And as for giving 'pa' his meals,
Or helping 'ma' to bake,
Oh dear ! 't would spoil their lily hands,
Though sometimes they make cake.

When winter came, the maiden's heart
Began to beat and flutter ;
Each beau would take his sweetheart out
Sleigh-riding, in a cutter.
Or, if the storm was bleak and cold,
The girls and beaux together
Would meet and have the best of fun,
And 'never mind the weather.'

ON RECREATION.

The strings of a lute, let down and remitted, do sound sweeter when they are raised again to their full pitch; and fields, being every year sowed, become at length very barren, but being some time laid fallow, repay the husbandman's patience with double increase. So our bodies and minds, if they have no remission from labours, will make but dull music; and if we do not sometimes let them lie fallow, and give them a summer tilth of seasonable recreation, they will soon become barren and fruitless.

Recreation is a necessary means of health, because it is demanded by the laws and requirements of our nature. Just as really as the animal creation recreate, and that without any lessons of instruction from man; so men, women, and children, when they are well, and allowed to act out the harmonious impulses of their nature without restraint, delight to indulge in recreation and amusement. The dog, the horse, the lion, the cat, the monkey, are all disposed at times to gambol, and to indulge in parental playfulness; nor is this disposition wanting in the world of mind, which, as it progresses in its development, seeks recreation and amusement suited to its tastes, and of a character more mental and refined.

All classes of society engage in recreation *and amusement*, and those especially who, from choice or necessity, follow the useful occupations which are generally carried on in populous places and large manufactories, find a very great relief and advantage in having recourse to such relaxation from their more severe labours. If judiciously managed as to their kind, and time and energy devoted to them, these amusements might be made a more efficient means than they now are of counteracting the injurious effects arising from the disease of certain muscular powers, and from those distorting and cramping positions of the body to which persons in most kinds of business are subjected. They would thus not only benefit the body, but serve as a diversion from many corrupting and baneful influences, and modes of passing away time not devoted to business, and which too often lead to practices more injurious to health and destructive to life than the most unhealthful occupations.

1. As to the kind of recreation to be indulged in, this depends upon the tastes and circumstances of the individual. Games of all kinds popular in this country, and which most persons are familiar with, are found to answer the purpose. It is for each person to select such as he finds most agreeable. An enlightened judgment will soon be able to decide which is most appropriate. There should be a variety in the amusement, so that all the faculties may be exercised in perfect harmony.

No mere gratification of the body or senses only should be sought, as instead of being found salutary, it will prove the reverse. All profitless amusements should be avoided, as unworthy of virtuous youth or a man of sense, and as a waste of time and power.

2. Recreation should be practised only when it is requisite for maintaining cheerfulness, and counteracting the depressing effect of work and serious occupation. It should be taken when all necessary work is over. The motto should be 'Work and then play.'

It should be taken regularly, and become part of our daily occupation.

3. All recreation should be active, and, as much as possible, out of doors, especially for persons whose employment is sedentary. When, however, it is necessary to submit to a heated atmosphere, or other injurious circumstances, care should be taken to avoid subsequent exposure. Special care should be taken to avoid internal strains.

4. Let all recreation be practised—although it be amusement—as you perform your daily labour: from a manly consciousness that you are doing your duty, and in thus acting out your nature in harmony with the other laws of your being, you do the will of the all-wise Creator, who established those laws.

GREAT MEN WHO VALUED RECREATION.

Even the leisure classes are, in a measure, compelled to work or take recreation sometimes, as a relief from ennui, but in most cases to gratify an instinct which they cannot resist. Some go fox-hunting in the English counties, others grouse-shooting on the Scotch hills, while many wander away every summer to climb mountains in Switzerland. Hence the boating, running, cricketing, and athletic sports of the public schools, in which our young men at the same time so healthfully cultivate their strength both of mind and body. It is said that the Duke of Wellington, when once looking at the boys engaged in their sports in the playground at Eton, where he had spent many of his own younger days, made the remark, 'It was there that the battle of Waterloo was won.'

Daniel Malthus urged his son, when at college, to be most diligent in the cultivation of knowledge, but he also enjoined him to pursue manly sports as the best means of keeping up the full working power of his mind, as well as of enjoying the pleasures of intellect. 'Every kind of knowledge,' said he, 'every acquaintance with nature and art, will amuse and strengthen your mind, and I am perfectly pleased that cricket should do the same by your arms and legs. I love to see you excel in exercises of the body, and I think myself that the better half, and much the most agreeable part, of the pleasures of the mind, is best enjoyed while one is upon one's legs.'

The following story also enforces the necessity of recreation:—

'It is reported of a good old primitive Christian, that, as he was playing with a bird, two or three youths, as they were passing by, observed it, and one of them says to the other, "See how this old man plays like a child with a bird!"—which the good man overhearing, calls to him, and asks him what he had in his hand. "A bow," says he. "What do you with it, and how do you use it?" said the other. Whereupon the young man bent his bow, and notched his arrow as if he had been ready to shoot; then after some short time unbent his bow again. "Why do you so?" said the holy man. "Alas!" says the young man, "if I should always keep my bow ready bent, it would prove a slug, and be utterly disabled for any further service." "Is it so?" said the good man; "then, my son, take notice that, as thy bow, such is the condition of all human nature. Should our thoughts and intentions be always taken up, and the whole bent of our mind set upon the study of divine things, the wings of devotion would soon flag, and the arrows of contemplation fly *but slowly* towards heaven."'

ON REST.

Man's rich restorative: his balmy bath,
That supples, lubricates, and keeps in play
The various movements of this nice machine,
Which asks such frequent periods of repair.
When tir'd with vain rotations of the day,
Sleep winds us up for the succeeding dawn;
Fresh we spin on till sickness clogs our wheels,
Or death quite breaks the spring and motion ends.

SLEEP, 'Nature's sweet nurse,' is the great restorer of vitality, when tired by labour or worn by disease. The machinery of the human frame undergoes a thorough repair of the wear and tear of daily employment. Thus persons who sleep long and sound have undoubtedly the best health, and are commonly the longest livers. During the period of sleep, nature holds her most powerful dominion over the body; it is then that the assimilation of the remains of food proceeds most rapidly, and the body grows the fastest. The sleep of health is full of tranquillity. In such a state we remain in unbroken repose, nature banqueting on its sweets, renewing its lost energies, and laying in stores for the succeeding day. This accomplished, slumber vanishes, languor is succeeded by strength, and a feeling of comparative youthfulness.

About one-third of our existence is spent in sleep, from which we infer that sleep is just as necessary to our continued healthy existence as wakefulness. Indeed, continual wakefulness becomes insanity; and sleep, when continued too long, has a tendency to destroy the healthy action of the nervous system. It is evidently, therefore, of the first importance that our sleep should be so regulated and secured, that it may not be interrupted, neither becoming too deficient in quantity, nor indulged in too long.

To insure good sleep, the following directions should be observed:—

1. As to the time of sleep.—Eight hours is sufficient for all those persons who work moderately, and live regularly. Children will sleep an hour longer with benefit, while there is a difference to be observed between males and females in their requisite terms of sleep. In cold weather we are naturally more torpid than in warm; but this has but little influence on man in a civilised state, as he has always the means of keeping the body in a comfortable temperature by clothing.

The hours of retiring to rest should be regularly observed. To retire at ten, and rise at six, is the common practice of many, and these are very good hours for securing the necessary repose. To sleep as much at night, and make as much use of the daylight as possible, is beneficial to health: thus the proverb says:—

> Early to bed, and early to rise,
> If you would be *healthy*, wealthy, and wise.

All persons in ordinary health should rise on awakening out of their *first* sleep. The practice is likely to produce more soundness of rest. A second sleep is seldom refreshing, and often does harm rather than good.

2. Males' beds should be hard, and not of a nature to generate heat. The expanded support and the heat of a feather-bed, relax the muscular system and enervate the frame.

The best beds are those made of hair—the hair mattress, for example—palm-leaf, wool, or cotton.

Females' beds should be somewhat softer, to suit the requirements of the body.

Damp beds should be carefully avoided.

3. Too much clothing should not be used, as it retards the free circulation of the blood, and often produces numbness or coldness in the limbs, which is highly injurious. Clothing sufficient to produce warmth is all that is necessary.

The bed clothes should be clean, and daily exposed to the pure fresh air.

No part of the apparel worn during the day should be used during the night; the best way is to have linen prepared in which to sleep, which may be laid aside in the morning.

Curtains are mischievous things, as they prevent a proper ventilation round the sleeper.

4. During sleep the limbs should be extended or stretched out, and the head uncovered. The position of the body in bed is of considerable importance. Lying with the head turned down upon the chest has a bad effect, and cases very seldom occur where the head should be elevated so much on pillows as is often done.

5. Unless the room be very large, not more than two persons should sleep in the same apartment together, and on no account should the sick and the healthy sleep together, nor should children sleep with the aged.

6. Rest, if not sleep, should be taken after every full meal, and at other intervals, during hard exertion, so as to prevent over-fatigue. For ordinary sitting purposes a hard seat should be used, as it is for several reasons much more healthy than a soft one.

7. Great care should be taken to avoid pressure on the head during the day. This is often produced by tight hat-bands or caps, and is very injurious, inasmuch as it produces cerebral excitement, and thus prevents sound sleep at night.

Thinking or study should not be indulged in during the hours intended for repose. It causes restlessness, and its effects in many other respects are injurious.

8. No full meals should be taken within three or four hours of retiring to rest, as it often prevents good sleep.

Reflections of a King on Sleep.

How many thousand of my poorest subjects
Are at this hour asleep! Sleep, gentle sleep,
Nature's soft nurse, how have I frighted thee,
That thou no more wilt weigh my eyelids down,
And steep my senses in forgetfulness?
Why rather, Sleep, liest thou in smoky cribs,
Upon uneasy pallets stretching thee,
And hushed with buzzing nightflies to thy slumber;
Than in the perfumed chambers of the great,
Under the canopies of costly state,
And lulled with sounds of sweetest melody?
O thou dull god! why liest thou with the vile
In loathsome beds, and leav'st the kingly couch
A watch-case or a common larum bell?
Wilt thou upon the high and giddy mast
Seal up the shipboy's eyes, and rock his brains
In cradle of the rude imperious surge,
And in the visitation of the winds,
Who take the ruffian billows by the top,
Curling their monstrous heads, and hanging them
With deaf'ning clamours in the slippery clouds,
That, with the hurly, death itself awakes?
Canst thou, O partial Sleep! give thy repose
To the wet seaboy in an hour so rude,
And in the calmest and most stillest night,
With all appliances and means to boot,
Deny it to a king. Then, happy low, lie down!
Uneasy lies the head that wears a crown.

PROMOTERS OF HEALTH.

ON TEMPERANCE.

Temperance is a bridle of gold; he who uses it rightly is more like a god than a man. Temperance is the silken string running through the pearl chain of all virtues.

By keeping our bodies in temperance as respects diet, is meant avoiding excess, with regard both to the quantity and quality of our food. We should neither eat more than our stomachs can well bear nor be nice and delicate in our eating.

To preserve the body in health is the end of eating, and they who regulate themselves merely by this end, observe perhaps the best rule of temperance. They go rather, indeed, beyond temperance, and may be called abstemious. A man may be temperate, and yet allow himself occasionally a little more indulgence. Great care, however, is here necessary; and the more, as perhaps no precise rule can be affixed after we have passed the first great limit and let the palate loose among variety. Our own discretion must be our guide, which should constantly be kept awake by considering the many bad consequences which attend a breach of temperance.

To enjoy a comfortable meal when it comes before us is allowable, but he who suffers his mind to dwell on the pleasures of eating, and makes them the employment of his thoughts, has at least opened one source of mental corruption.

After all, he who would most perfectly enjoy the pleasures of the table, such as they are, must look for them within the rules of temperance. The palate accustomed to satiety hath lost its tone, and the greatest sensualists have been brought to confess that the coarsest fare, with an appetite kept in order by temperance, affords a more delicious repast than the most luxurious meal without it. General experience also proves that nothing contributes more to the preservation of human life than temperance and simplicity of living; and they who describe the golden age, or the age of innocence, represent the customary food of it as the plainest and most simple.

It is always a very ominous and unfavourable sign for a young man to be fond of what is called *high living*. Great eaters never live long. A voracious appetite is a sign of disease or of a strong tendency to disease, and not a sign of health, as is generally supposed. Ill health as infallibly follows the indulgence of such an appetite as any other effect its legitimate cause.

The dissuasives from eating intemperately that appear of the greatest weight are these :—It is the grossest abuse of the gifts of Providence. It is the vilest debasement of ourselves. Our bodies owe to it the most painful diseases, and generally a speedy decay. It frequently interrupts the use of our nobler faculties, and it is certain at length greatly to enfeeble them. The straits to which it often reduces us occasion our falling into crimes which would otherwise have been our utter abhorrence.

We have thus far referred to temperance as respects eating, and the same remarks apply to temperance or sobriety in drinking.

The strictest, and perhaps the best, rule is merely to satisfy the thirst—the end of drinking. But if a little more indulgence be taken, it ought to be taken with the greatest circumspection.

With regard to youth, indeed, I should be inclined to great strictness on this head. In eating, if they eat of proper and simple food, they cannot easily err. Their growing limbs and strong exercise require larger supplies than full-grown bodies, which must be kept in order by a more rigid temperance. But if more indulgence be allowed them in eating, less surely should in drinking. With strong liquors of every kind they should have nothing to do, and if they totally abstain on this head, it were so much the better. The languor which *attends* age requires, perhaps, now and then some aids, but the spirits of youth want no recruits—a little rest is sufficient.

As habits of intoxication are not soon or easily acquired, being in most constitutions, especially in early years, accompanied with fits of fever, headache, and other unpleasant ailments, young persons may easily guard against them. I have sometimes met with those who made it a rule never to drink anything stronger than water, who were respected on that very account, who enjoyed health, and strength, and vigour of mind, and gaiety of heart in an uncommon degree. Now, if I could prevail on my young friends to imitate such examples, I should do much good to their bodies and souls, their fortunes and intellects, and be happily instrumental in preventing a thousand vices and follies, as well as many of those infirmities which beset the old age of him who has given way to intemperance in youth.

As to the bad consequences derived from excessive drinking, besides filling the blood with bloated and vicious humours, and debauching the purity of the mind, as in the case of intemperate eating, it is attended with this peculiar evil—the loss of our senses. Hence follow frequent inconveniences and mortifications.

By habitual intemperance we forfeit the esteem of our fellow-citizens; we are disqualified for every public duty, and we prepare ourselves for the violation of every law; for whether we become stupid by gluttony or frantic with drunkenness, we show ourselves equally insensible to the dignity of our nature and to the calls of honour and duty. In private life, by the practice of intemperance, we expose our follies, we betray our secrets — we are often imposed upon, we quarrel with our friends, we lay ourselves open to our enemies, and, in short, make ourselves the objects of contempt and the topic of ridicule to all our acquaintance. Nor is it only the act of intoxication which deprives us of our reason during the prevalence of it; the habit of drunkenness soon besots and impairs the understanding, and renders us at all times less fit for the offices of life.

MEN WHO ENJOYED ROBUST HEALTH AND LIVED LONG LIVES ON ACCOUNT OF THEIR TEMPERANCE.

Many instances might be adduced of men, both in ancient and modern times, whose robust health and length of life testify to the importance and value of temperance.

One of the most notable illustrations is that of the Prophet Daniel, recorded in the Sacred Scriptures. Stedfastly refusing the luxuries of the king's table, and persisting in his simple *diet of* pulse and water, he grew in beauty of body, vigour of intellect, and purity of spirit, till he far surpassed, even in the king's judgment, all those who feasted at the royal board. Turning to profane history, we learn that Galen, one of the most distinguished of the ancient physicians, lived one hundred and forty years, and composed between seven hundred and eight hundred essays on medical and philosophical subjects, and he was always, after the age of twenty-eight, extremely sparing in the quantity of his food. The Cardinal de Salis, Archbishop of Seville, who lived one hundred and ten years, was invariably sparing in his diet. One Lawrence, an Englishman, by temperance and labour, lived one hundred and forty years; and one Kentigern, who never tasted spirit or wine, and slept on the ground and laboured hard, died at the age of one hundred and eighty-five. Henry Jenkins, of Yorkshire, who died at the age of one hundred and sixty-nine, was a poor fisherman as long as he could follow his pursuit, and ultimately he became a beggar, living uniformly on the coarsest and most sparing diet. Old Parre, who died at the age of one hundred and fifty-three, was a farmer of extremely abstemious habits, his diet being solely milk, cheese, coarse bread, small-beer, and whey; but, being taken to court by the Earl of Arundel as a great curiosity in his one hundred and fifty-second year, he very soon died, in consequence of a change from a parsimonious to a plentiful diet. Henry Francisco, another famous case, lived to about one hundred and forty in America, and was, except for a certain period, when he became attached to ardent spirits, 'remarkably abstemious, eating but little, and abstaining almost entirely from animal food,' his favourite articles being tea, bread and butter, and baked apples. A Mr. Abraham Pratt, of Shutesbury, Massachusetts, who died at the age of one hundred and seventeen years, lived very much upon milk, and that in small quantity; and his son Michael Pratt attained to the age of one hundred and three years by similar means. Dr. Franklin, in his youth, by avoiding all stimulating meats and drinks, and adhering to a strictly temperate style of living, and even fasting one day every week, soon surpassed in every noble quality his companions, who were devoted to indulgence, and lived in the full vigour of his powers long after they were in their graves.

As a man cannot be temperate if he be not prudent, so no man can be strong or valiant if he be not temperate.

Unfit for raptures, or, if raptures cheer
On some high festival of once a year,
In wild excess the vulgar breast takes fire,
Till, buried in debauch, the bliss expire.

Great temp'rance, open air,
Easy labour, little care.

ON CHASTITY.

By unchaste looks, loose gestures, and foul talk,
But most by lewd and lavish acts of sin,
Defilement enters to the inward parts;
The soul grows clotted by contagion,
Imbodies and imbrutes, till she quite lose
The divine property of her first being.

THERE is no maxim as regards health of more importance than that of the Apostle, 'Flee youthful lusts, which war against the soul,' and there is surely nothing which carries on a war with the soul more successfully. Wherever we have a catalogue in Scripture of those sins which, in a peculiar manner, debauch the mind, these youthful lusts have always, under some name, a place among them.

There are no evils more insidious and indescribably heartrending than those resulting from the sins to which the Apostle here refers. Such vices are the 'pestilence that walketh in darkness.' These youthful lusts not only fearfully injure the bodily health, thus sapping the very foundation of life, but they defile the heart, and unfit the mind for anything that is pure and elevated, filling the imagination with such images as are ever making sinful suggestions, and drawing its devotee from healthy and holy thoughts.

If not resolutely opposed and subdued, they will gradually uproot all the finer senses and delicacy of feeling. Love, friendship, self-respect, hope, shame, and even fear, will be extinguished by them, and they will choke up with the noisome weeds of concupiscence every avenue by which moral and devotional feelings enter the heart, thus proving formidable foes to all instruction, and tending to destroy by their influence the stability of society. No other sins have inflicted so many ills on society, or produced greater domestic and individual misery than these; hence it becomes the duty of all those who 'love the purity and well-being of society' to speak plainly on the subject, and to warn the young especially against the dangers to which they are exposed.

Before we name the sins which the Apostle calls 'youthful lusts,' we would earnestly counsel our young readers not to turn away from the subject by any false delicacy, but to look at it in the right light—in the light of their own consciences and of God's Word.

What, then, are these sins?—these cruel, crying sins—these sappers and miners of health and happiness—these serpents which carry with them stings so sharp and poisonous? Are they gluttony and drunkenness? No; these are bad enough, but the sins we are about to name are worse. Gluttony and drunkenness frequently *lead to them*, and increase them, but they *may* be, and *are*, committed by those who are sober and temperate.

These sins are described in the Scriptures under two forms, as ‘fornication and uncleanness,’ and their commission is spoken of as ‘fulfilling the lusts of the flesh and of the mind.’

Do you know, reader, what ‘*fornication*’ means? Fornication and adultery are the same. Have you thought of the great guilt and long grief which it brings, as well as the short gratification it affords? Have you thought of the description given of it in the Bible, and of God’s denunciation of it, and those who commit it?

The ‘fornicator’ is one who has a *companion* in his sin, and although it may be done in *secret*, God, from whom nothing is hid, sees the adulterers, and will judge them.

In describing the ways of such sinners, the Scriptures speak of the twilight, the evening, the black and dark night, the harlot’s gay attire, her flattering speech, her heartless kiss, her false words, and then—the youth, the young man, void of understanding, yielding, following, sinning. As we look at him, and see him entering her house, solemn as a death-dirge the awful words of Scripture sound, ‘The ways of man are before the eyes of the Lord, and He pondereth all his goings. His own iniquities shall take the wicked himself, and he shall be holden with the cords of sin, and he shall die without instruction, and in the greatness of his folly he shall go astray.'

But 'fornication' is only one of the sins to which the Apostle alludes. We have spoken of 'uncleanness.' The Scriptures distinguish these in Ephesians ii. 3, and Colossians iii. 5. Uncleanness is a sin committed by a person in *secret* and *alone*. To give a description of it would make the cheek of innocence blush with shame. But, alas! it is a habit which fatally taints many of our youth—a habit which, of all others, is the most tyrannical and inexorable. Little do the young know what they are doing when they give way thus to these sinful inclinations.

You know, reader, what we refer to, and what we mean by 'uncleanness,' and you know *now*, if you did not know before, that it is wrong—a wrong done to your *body*, as well as to your *soul*, and that there is a terrible penalty hangs over its commission. Bear in mind that this *secret* sin, which no one knows of, perhaps, but yourself, has been seen by God's eye, and will not be forgotten by Him.

We sincerely hope, young reader, that you are free of both these crimes. Even if it be so, it is right that you should be warned, for temptations are thick around you, and snares are laid at your feet on every hand. If saved from *these evils* yourself, you should know how to warn others, for many around you are not free from these destructive vices.

We know that the natural propensity to gratify the passions is usually so strong, especially in youth, that it needs continually to be strenuously opposed in order to keep it in due subjection. The very thought of self-gratification by committing those sins should, when it arises, be instantly subdued. There must be no parleying with it, or it will prevail. Those who are addicted to such sins should remember that every time they indulge in them they become worse slaves to them, and that the case then becomes still more desperate.

We admit that it will be very difficult to curb these habits, and to obey God and the conscience, but it is not impossible. Let them awake, then, to their danger, and God will help them.

Young men, scorn to be the priests of this hideous shrine. Oh! if you would have *health*, *happiness*, and *honour* here, and felicity hereafter, 'flee youthful lusts.'

Is there something so enticing in debility, or fascinating in madness, that you should pursue them as desirable things? Is it really desirable that you should change lightness of heart, cheerful meals, untroubled slumbers, and gentle dispositions, for a constant impurity of thought, which shuts out all things that are great and good, clouds the imagination with insensibility, and creates a distaste for all manner of delight and comfort? Surely it is trifling with your common sense to suppose you will answer in the affirmative.

Finally, then, we would counsel you to preserve *purity of thought*. The dark recesses of the mind which the world cannot reach are the receptacles of sin. Here it finds its first encouragement. The entrance of impure ideas, perhaps, cannot always be prevented. We may always, however, prevent cherishing them. We may always prevent their making an impression upon us; the devil may be cast out as soon as discovered.

Remember, again, that if your bodies be the temples of the Holy Ghost, your minds are the very sanctuaries of those temples; and if there be any weight in the Apostle's argument against polluting your bodies, it urges with double force against polluting your minds.

But, above all other considerations, it behoves us most to keep our thoughts pure, because they are the fountains from which our words and actions flow. 'Out of the abundance of the heart the mouth speaketh.' Obscene words and actions are only bad thoughts matured, and spring as naturally from them as the plant from its seed. While we keep our impurities in our thoughts, they debauch only ourselves—bad enough, it is true. But when *we proceed to words* and *actions*, we let our impurities loose; we spread the contagion and become the corrupters of others.

Would you keep your thoughts pure, and thus preserve purity of words and actions, do not fail to use such helps as reason and religion prescribe. Avoid all company and all books that have a tendency to corrupt the mind, and everything that can inflame your passions. One thing ought to be your particular care, and that is never to be unemployed. Idle you should never be. A vacant mind is an invitation to vice.

ILLUSTRATIONS OF THE SAD RESULTS OF UNCHASTITY.

Now, come with me, young reader, to a hospital. Let us, for the sake of getting a better idea of things, suppose that we can move through its wards invisibly, seeing and hearing everything, but ourselves neither seen nor heard. Now, count the persons in the beds as we go along, look closely to their haggard features and wasted forms, listen to their groans, see how they turn restlessly from side to side, though they find it painful to do so. Hark! what sad and terrible things some of them utter in their troubled sleep. Having counted the tenanted beds, you report there are ninety. You are quite right. This is the exact number a friend of mine counted in a hospital not far from London, which he visited some time since. Nearly all the occupants of those beds were very young men, and *seventy* out of the *ninety* were in this sad case of weakness and pain through disease brought on by themselves. Yes; these seventy young men might have been in good health if they had only abstained from the gratification of their sinful nature—if they had not indulged in 'fornication and uncleanness'—those crimes of which we have been speaking.

We next enter a lunatic asylum. I will not try to describe the scenes of moping melancholy, of witless mirth, of brooding despair, of fierce blasphemy, of pitiable idiotcy which abound there. My object is not to gratify a morbid curiosity, but to impress upon your minds the solemn fact, that many of these pitiable beings have become inmates of this place in consequence of their indulging in the same sins as those in the hospital were guilty of. Further, I wish you to know that these are the very worst and most incurable lunatics. The brain is so affected, that medical men fear it will never resume its functions. The *secret* sin in which they indulged has been God's avenger, and a very terrible one it is.

I could take you to other scenes—in gaols, in prisons, and even in more private places where the young congregate—to show the workings and results of these terrible yet common sins. But not wishing, unnecessarily, to continue these descriptions, I will tell you of only one more fact.

A few years ago you might have seen a boy, full of life and health, with bloom on his cheeks, fire in his eyes, and vigour in every limb. Look at him now, blighted, stooping, pale and thin, not liking to look any one in the face. 'Surely,' you will say, 'this cannot be the same youth I saw before.' Yet this is the case. His parents are much concerned about his health, and wonder what is the matter with him. He has just been to the doctor, who has told him that his lungs are affected, and that his whole constitution is shattered; but he has not told him the cause of this sad state, and perhaps even he does not guess what it is. Not long after, a friend takes this young man aside, and puts a few plain questions to him which he cannot evade. 'Cannot you,' says the faithful friend, 'guess the reason for all your weakness and decay?' 'No,' is the reply. 'Have you not been guilty of certain *secret* sins?' The young man makes no answer. His pallid cheeks are covered with blushes, but presently, with downcast eyes, he answers, 'Yes;' and adds, 'But I was not aware *this* was the cause of my illness.' 'Depend upon it,' said his friend, 'that *is* the *cause*, and you must at once abandon it, or speedy death will follow.' 'Oh!' said the young man, deeply affected, 'tell R—— D——, for he taught me this abominable habit; his intellect is much impaired, and he is already partially deaf; and do write to F—— H——, for I led him astray; and now he is far away, and may be teaching others also to destroy themselves.'

The young man then affectionately bid adieu to his friend, but it was their last interview—in a few months after the young man *died.*

Remember, reader, these are not made-up stories, every case mentioned is true, and many thousands more are to be found.

Alas! for such young men! Was it for *this* that their mothers nursed and reared them—for *this* that their fathers laboured and toiled—for *this* that their teachers instructed and prayed? We know, young reader, that your answer to this question will be 'No.' Let such cases then prove a warning to you, and fail not to engrave in your memory the injunction of the Apostle, 'Flee youthful lusts, which war against the soul.'

Purity will do well in nothing without the heart; the heart can be happy in nothing without purity. It is a great pity two such sweet companions should be kept asunder. The God of all purity bring them together.

So dear to Heaven is saintly chastity,
That when a soul is found sincerely so,
A thousand liv'ry'd angels lacquer her,
Driving far off each thing of sin and guilt.

THINGS INJURIOUS TO HEALTH.

ON NARCOTICS.

ON OPIUM.

> When I reflect on what I have seen, what I have heard, and what I have done, I look upon all that is passed as one of those romantic dreams which opium commonly occasions, and I do by no means desire to repeat the nauseous dose.

Opium may be considered as the type of all narcotics, and for this reason we place it at the head of our list.

The exceedingly injurious effects of opium are so generally acknowledged by all those capable of forming an opinion on the matter, that any long description of this drug is scarcely needed.

The practice of taking opium, however, and other drugs of the same class, such as laudanum, morphia, &c., prevails to so large an extent—much larger than persons generally suppose—that we are doing a service to our readers if, in referring to it, we can induce them to see the importance of carefully avoiding its use.

We may first state a few facts, in order to give some idea of the wonderful extent to which the human constitution is capable of being turned aside, by degrees, from its appropriate work, and natural condition, by the use of this drug, and then show the danger of commencing its use on account of the sad results which follow.

Dr. Thompson, an authority on the subject, declares, in his Materia Medica, that he was consulted by a lady who absolutely took 100 grains of opium daily! and Dr. Smith, another eminent writer, relates the case of a man who was in the habit of taking the enormous quantity of 180 grains daily! but more extraordinary still are the facts recorded in a work by Thomas De Quincey, entitled, 'The Confessions of an Opium-eater.' In this work the author informs us that from small beginnings he increased his dose of opium until he took 320 grains daily! which he estimated to be equal to 8,000 drops of the tincture of opium, called laudanum.

Now, instances are recorded in which four grains of opium have proved a fatal dose for an adult, and yet a person may, by beginning with very small doses, go on increasing them until such quantities as those we have named may be taken apparently without fatal results—a most remarkable proof, indeed, of the extent to which Nature may be trifled with before punishing the offender for a transgression of her laws.

To show the effects of opium—the fearful ravages which such practices as those described make on the human system, we may refer to the narrative already mentioned, whose author used this drug for many years, and whose experience is recorded in his 'Confessions,' in order that a description of the miseries he eventually endured might prove a warning to others.

EXTRACTS FROM 'THE CONFESSIONS OF AN OPIUM-EATER.'

The Author of this work informs us that his introduction to opium commenced when he was twenty-eight years of age. One day while suffering from severe tooth-ache, he happened to meet a friend, who advised him to try opium. He immediately purchased and took the prescribed dose, and we are told that 'in about an hour afterwards, the pains of the tooth-ache had vanished, and with them some severe pains in the stomach to which he had been occasionally subject for many years.' In addition to these effects, he felt certain 'elevating and pleasurable sensations,' unknown to him before.

Having succeeded so well in this experiment, he thus laid the foundation of a practice which he afterwards deeply regretted.

The use of opium was continued for about eight years apparently without injury to his health. This immunity from suffering he accounts for by stating that its use was only 'occasional, and at regular intervals.'

In speaking of the effects of the drug on his system during this time, he refers first to the supposition that opium intoxicates, and remarks that ‘no quantity of opium will intoxicate. The pleasure given by wine is always mounting, and tending to a crisis, after which it declines; that from opium, when once generated, is stationary for eight or ten hours; the one is like a flame, the other a steady equable flow.’ Then, secondly, as to the belief that the elevation of spirits produced by opium is necessarily followed by a proportionate depression, he says, ‘I have found that the day following the dose was always a day of unusually good spirits, the primary effects of opium being always in the highest degree to excite and stimulate the system.’

At the end of the eighth year from the commencement of the practice of taking opium he suffered much from distress of mind occasioned by some melancholy event, and this was followed by an appalling irritation of the stomach, similar to that from which he had already suffered, but much more intense.

To ease himself of this pain he now, instead of continuing to take opium occasionally, began to use it daily, and thus became a confirmed opium-eater; his dose soon amounting to as much as three hundred and twenty grains—equal to about eight thousand drops of laudanum.

This practice continued, with some variations as to quantity, for about three years, at the end of which period he began to experience great suffering, which induced him to make an attempt to reduce the quantity of opium taken, with the view of entirely abandoning its use. Of the difficulties of this attempt, and the sufferings he experienced, he says: 'It is always found that down to a certain point the dose can be reduced with ease, and even pleasure, but that after that point further reduction causes intense sufferings—a state of unutterable irritation of the stomach, accompanied by intense perspiration, and feelings such as I shall not attempt to describe.' And he adds, in reference to his efforts to abstain from opium—'those who witnessed the agony of those attempts, and not myself, were the first to beg of me to desist.' His dreams are spoken of as 'positively distressing, all changes in them being accompanied by a deep-seated anxiety and gloomy melancholy, such as are wholly indescribable in words.'

In writing to a friend at this time, he says: 'I am now a helpless sort of person, who cannot even arrange my own papers without assistance. My studies have been long interrupted. I cannot read with any pleasure—hardly with a moment's endurance. Mathematics and intellectual philosophy are insupportable to me. I shrink from them with a sense of powerless and infantile feebleness that gives me an anguish the greater from remembering the time when I grappled with them to my own hourly delight.

Of his final attempt to extricate himself from the habit of opium-eating we are told, that 'opium had long ceased to found its empire on spells of pleasure, as it was solely by the tortures connected with the attempt to abjure it that it kept its hold;' and he adds—'a choice only of two evils was left—I saw that I must die if I continued the opium. I determined therefore, if that should be required, to die in throwing it off. How much I was taking at this time I cannot say, for the opium which I used had been purchased by a friend, who afterwards refused to allow me to pay him, so that I could not ascertain even what quantity I had used within the year. I apprehend, however, that I took it very irregularly, and that I varied from about fifty or sixty, to one hundred and fifty grains per day. My first task was to reduce it to forty, to thirty, and, as fast as I could, to twelve grains. I triumphed—but think not, reader, that therefore my sufferings were ended. Think of me as one, even when four months had passed, still agitated, writhing, throbbing, palpitating, and shattered. Meantime, I derived no benefit from any medicine except one prescribed to me by an Edinburgh surgeon of great eminence, namely, ammoniated tincture of valerian. Medical account, therefore, of my emancipation I have not much to give. During the whole period of diminishing the opium I had the torments of a man passing out of one mode of existence into another. The issue was not death, but a sort of physical regeneration; and I may add that ever since, at intervals, I have had a restoration of more than youthful spirits, though under the pressure of difficulties which, in a less happy state of mind, I should have called misfortunes. One memorial of my former condition still remains—my dreams are not yet perfectly calm, the dread swell and agitation of the storm have not wholly subsided, the legions that encamped in them are drawing off but not all departed, my sleep is still tumultuous, and, like the gates of paradise to our first parents when looking back from afar, it is still "With dreadful faces throng'd, and fiery arms."' In conclusion, he says that the moral of his narrative is 'addressed to the opium-eater, and therefore, of necessity, limited in its application. If he is taught to fear and tremble, enough has been effected. But he may say that the issue of my case is at least a proof that opium, after so many years' use and abuse of its powers, may still be renounced, and that *he* may chance to bring to the task greater energy than I did, or that with a stronger constitution than mine he may obtain the same result with less suffering. This may be true; I would not presume to measure the efforts of other men by my own. I heartily wish him more energy—I wish him the same success.'

ON TOBACCO.

Whatever the advocates of tobacco may say in its defence, the fact is not to be disputed that its use, especially by those whose nervous temperament has early fitted them for a keen enjoyment of the passions, is often followed by very deplorable results.

TOBACCO possesses most of the noxious qualities of other narcotics. The effects that result from smoking are due to different agents imbibed by the smoker, namely, carbonic acid, ammonia, nicotine, a volatile empyreumatic substance, and a bitter extract. The more common effects are traceable to the carbonic acid and ammonia; the rarer and more severe effects to the nicotine, the empyreumatic substance, and the extract.

All the evils of smoking are functional in character, and no confirmed smoker can ever be said, so long as he indulges in the habit, to be well.

Smoking produces disturbances, first, in the blood, causing undue fluidity and change in the red corpuscles; secondly, on the stomach, giving rise to debility, nausea, and in extreme cases sickness; thirdly, on the heart, producing debility of that organ and irregular action; fourthly, on the organs of sense, causing in the extreme degree dilation of the pupils of the eye, confusion of vision, bright lines, luminous specks, and long retention of images on the retina, with other and analogous symptoms affecting the ear, namely, inability clearly to define sounds, and the annoyance of a sharp, ringing sound like a whistle or bell; fifthly, on the brain, suspending the waste of that organ, and oppressing it if it be duly nourished, but soothing it if it be exhausted; sixthly, on the nervous filaments and sympathetic or organic nerves, leading to deficient power in them, and to over-secretion in those surfaces—glands—over which the nerves exert a controlling force; seventhly, on the mucous membrane of the mouth, causing enlargement and soreness of the tonsils (smoker's sore throat), redness and dryness, and occasional peeling off of the membrane, and either unnatural firmness, or contraction, or sponginess of the gums; eighthly, on the bronchial surface of the lungs, when that is already irritable, sustaining the irritation, and increasing the cough.

Chewing is the worst manner in which tobacco can be used: the waste of saliva is most serious, and the derangement of the digestive organs, and consequent disease of the stomach and liver, most severe.

To the young, until the growth is completed, and the fat and tissues of the body exceed the supply, tobacco is very hurtful. It enfeebles the vital energy, and retards the processes of nutrition and assimilation, impairs growth, brings premature manhood, and general physical degradation.

Tobacco is usually in its immediate effects apparently beneficial and soothing to the system, relieving the uneasy feelings produced by bodily and mental exhaustion. Hence there is some show of reason in its favour. Again, the use of tobacco being so very general forms a strong inducement to persevere with it, and there are consequently few practices into which a youth is more likely to fall than that of smoking. The habit once formed, speedily becomes strong and fascinating, and before long a perfect slavery, even in cases in which there was at first no great inclination for it. This fact, and the truly pitiable condition into which thousands upon thousands ultimately bring themselves by the habit, loudly demands of every one before commencing the indulgence serious consideration.

No substantial argument can be advanced in favour of the use of tobacco on account of any real benefit arising from it. It is a mistake to suppose that smoking aids digestion. The fact is, that most persons, after discontinuing the use of tobacco, have an increase of appetite and digestive energy. It is indisputable that health is in no way improved by smoking. Those who use tobacco may seem to bear its effects with impunity, but it is simply because the previous use of the drug has induced a perverted or morbid state of the system, to which further continuance of the drug's use brings at least a temporary relief.

The objections urged against the use of tobacco more or less apply to the use of cigars and to snuff-taking. Snuffing injures the sense of smell, affects the sight, the voice, breathing, and digestion, and it has a strong tendency to produce determination of blood to the head, and apoplexy.

As far as the individual is concerned, the practices of smoking and snuffing are not only to be condemned on account of the physical degradation they induce, an unmistakable idea of which is conveyed to the mind of any one who will take the trouble calmly to reflect upon the subject, but also on account of the habits of uncleanliness they often engender.

The use of tobacco, &c., considered in its relation to the comfort and feelings of others, is an odious custom. The smoker is usually very selfish; he perseveres in contaminating the atmosphere, and is careless whom he annoys, and thus he becomes a fitting inmate of the tavern only.

In conclusion, looking at the generally pernicious effect produced on society by the use of tobacco, it is amazing that this practice should prevail to such a fearful extent, without calling forth more consideration and remonstrance.

The number of smokers in Great Britain, it is said on good authority, is upwards of a million. 'Why should there exist perpetually a million of men, not one of whom can at any moment be writ down as in perfect health from day to day? Why should a million of men be living with stomachs that only partially digest, hearts that labour unnaturally, and blood that is not fully oxydised? In a purely philosophical point of view, the question admits of but one answer, namely, that the existence of a million of such imperfectly working living organisms is a national absurdity, a picture which, to a superior intelligence observing the whole and grasping it, would suggest a mania foolish, ridiculous, and incomprehensible.'

EXPERIMENTS PROVING THE INJURIOUS EFFECTS OF TOBACCO.

Professor J. S. Rogers, in endeavouring to ascertain by experiment the effects produced on the system by various kinds of narcotics, says, in speaking of the external application of tobacco, that 'a leaf of tobacco, when dipped in brandy and applied to the stomach of a person unaccustomed to its action, will often induce vomiting, vertigo, prostration of strength, cold sweats, and the exact appearance of approaching death.' Another writer on this subject gives an account of a man who was seized with vertigo, nausea, vomiting, and other distressing symptoms, by applying a wash of tobacco to his body; and an eminent physician informs us that three children, who had a lotion of tobacco applied to their bodies for the cure of a certain ailment, were 'seized as a consequence with dizziness and profuse sweats, and that other painful effects were induced by this treatment.'

To these instances many more might be added, which show that the lotion of tobacco-juice has proved a deadly poison.

If the effects of tobacco are so pernicious when merely applied to the surface of the body, what must be its ravages when inhaled by the lungs, or brought in contact with the brain, or swallowed with the saliva, as it is always more or less when chewed?

As an instance of its fatal effects when used internally, we may here mention the case of a young man whose death was caused by excessive smoking. An account of this case in the newspapers states that 'the deceased was of sound constitution, and, with the exception of smoking, was temperate in everything. He was seized with sudden prostration of strength, which proved fatal in a few days. On an examination of the body after death, it exhibited no traces of disease. Two medical men attributed his death solely to great indulgence in smoking.'

ON ALCOHOL.

Though I look old, yet I am strong and lusty;
For in my youth I never did apply
Hot and rebellious liquors in my blood.

PROPER food, air, and exercise, which invigorate the body by supplying it with real strength and energy, are the only things which stimulate it within the healthy limit; and all such things as produce increased activity of any organ, without supplying real strength, may be said to over-stimulate.

The principal articles which come under this class are what are called intoxicating drinks, the characteristic ingredient in which is the spirit called alcohol.

The immediate effect of intoxicating drinks is to give apparently increased strength and cheerfulness, and hence they have been considered to be useful in order to the performance of labour, and very appropriate for occasions of sociality.

It is now, however, a nearly universally conceded fact, that stimulants in the form of ardent spirits, wines, and strong ales are unnecessary—nay, as articles of diet, pernicious—that they impair the power of the nervous system, that is to say the use of these liquors first excites the nervous system above, and then depresses it below, the natural standard.

As to the daily medicinal use of alcohol, Professor James Miller, of Edinburgh, says:—'It may be well to correct an important error yet very current, in regard to the medicinal use of alcohol. People regard it as a simple and common tonic, and are ready to accept its supposed help as such in every form of weakness and general disorder of health. But it is ordinarily no true tonic. In its primary effect it is merely a stimulant, with narcotic reaction when taken in large doses. And in its secondary action it is the reverse of a tonic. For while iron, for example, enters the blood and acts beneficially thereon, alcohol entering the blood acts injuriously, so injuriously that even its advocates admit that were it constantly present the result would be fatal. Alcohol as a medicine is very valuable, but not as a true tonic.'

The same author thus describes the ultimate effects of alcohol on the system:—'The whole body trembles, but especially the limbs, and the tongue, eyesight, and hearing are impaired; the skin is affected by various morbid sensations; the mind at best is weak and often disordered; general debility increases; sleep is capricious, disturbed, and unrefreshing; strength, appetite, flesh, comfort, energy, all disappear. There is no relief save what is both temporary and delusive; in a continuance of the poison the stomach rejects food, and puts forth foul secretions of its own, startings seize the limbs, epilepsy may follow, and the man may die.

Arsenic could not sap life more surely, and all may be done, be it remembered, without the victim having ever once been absolutely drunk.'

Sir Astley Cooper, in speaking on the same subject, remarks:—'I never suffer ardent spirits in my house, thinking them evil spirits; and if persons could witness the white livers, the dropsies, and the shattered nervous systems which I have seen as the consequence of drinking them, they would be aware that spirits and poisons are synonymous terms.' Dr. Lettsom declares that 'nearly all the illness of his adult patients, and most of the cases of sudden death that came under his observation, were occasioned by the practice of taking a glass of spirits and water after dinner;' and Dr. Trotter fully confirms this opinion. Dr. Buchan says, 'Malt liquor occasions obstructions, inflammation of the lungs, &c., which are brought on by the glutinous and indigestible nature of strong ale;' and he tells us that 'wine and spirits are still worse, as they inflame the blood, and tear the tender vessels of the lungs to pieces.' Another physician declares that, 'if an end were put to the drinking of port, sherry, punch, &c., medical men and apothecaries would be ruined, and medical drugs would be quite unnecessary.' 'Strong beer,' says another, 'has no power to allay the intemperate use of spirits, but it will finish what ardent spirits began;' and then adds, 'Beer gives us the stupidity of an idiot, and *ardent spirits* the frenzy of the demon.'

EFFECTS OF INTOXICATING DRINKS ON THE DURATION OF LIFE.

Mr. Neison, an eminent actuary, has made a series of observations on the mortality of intemperate persons, and states that, at the term of life from 21 to 30, the mortality of this class, during the period over which his calculations extended, was upwards of five times that of those of the same age taken from the general community. He informs us that an intemperate person of 20 years has a probability of life extending to about 15 years, while one of the same age taken from the general population of the country would probably live to about 44 years; that an intemperate person of 30 years would have a probability of life extending to about 13 years, while one of the same age taken from the general population would probably live 36 years; and that an intemperate person of 40 years would have a probability of life extending to about 1¼ years, while one of the general population would probably live about 28 years. He also gives some curious results as to the influence of different kinds of intoxicating drinks on the duration of life among intemperate persons: beer-drinkers' lives averaging about 21 years; spirit-drinkers' about 16½ years; and those who drink both beer and spirits indiscriminately, about 16 years. Other results are given, as to the duration of life among various classes of persons of intemperate habits; mechanics' and labouring men's lives averaging about 18 years; traders, dealers, and merchants, 17 years; professional men and gentlemen, 15 years; and females, 14 years only.

Another authority, a medical man connected with the army, tells us that, 'in the year 1849 it was found that, out of 500 men of the European part of the Madras army who used no fermented liquors of any kind, only five died within twelve months; that out of 500 men who took fermented liquors in a strictly moderate way, eleven died in the same time; but that out of 500 intemperate men, twenty-two died in twelve months.'

In speaking on the same subject, a physician of eminence says that, 'if ten young men at the age of 21 years drink a glass of ardent spirits, or a pint of port or sherry, every day, the lives of eight of them will be shortened by 10 or 15 years each.'

'These and numerous other facts of a similar nature that might be adduced, place the matter beyond all dispute, that he who enjoys the blessing of a healthy frame, and desires to retain what he enjoys, ought to train himself to habits of the strictest temperance; and that a part of these habits of temperance should be the avoidance of the unnatural stimulus which every *form of* intoxicating liquors contains. The man who never commits, from his youth upward, a single excess in drinking, and who never admits a single drop of alcoholic poison into his blood, removes himself at once, by these simple means, out of the sphere of the influence of at least *three-fourths* of the causes that are operating in the production of disease in the human frame.'

It is above all important that the practice of taking stimulants should never be begun, for if they are never taken they will not be craved after; but the habit once acquired becomes most difficult to shake off. In conclusion, therefore, we would counsel our young readers seriously to reflect on this lesson, and we feel sure that they will then come to the decision to adopt heartily the sentiments expressed in the following lines:—

Oh! water for me! Bright water for me!
It enslaves not the soul, it enchains not the free;
It cooleth the brow, it cooleth the brain,
It maketh the faint one strong again;
It comes o'er the sense like a breeze from the sea—
All freshness, like infant purity.

Fill to the brim! fill, fill to the brim!
Let the flowing crystal kiss the rim!
For my hand is steady, my eye is true;
For I, like the flowers, drink nought but dew.
So water, pure water, for me, for me!
'Tis the drink of the wise, 'tis the wine of the free.

ON TEA AND COFFEE.

Many estates are spent in getting,
Since women for tea forsook spinning and knitting,
And men to get punch forsook hewing and splitting.

STRONG green tea and coffee are powerful stimulants, and tend, especially if taken in large quantities, to injure the stomach, produce dejection of spirits, and when there is a deficiency of food in the stomach, to waste the tissues of the body and lower the vital powers; indeed, they may be said to be quite as injurious as tobacco. The same is true, but to a limited extent, of black tea.

Tea and coffee, like beer, contain a certain amount of nutrition, and are entirely devoid of that suspicious influence that beer possesses. He, therefore, must be on the safer side who falls back on these rather than on beer, when anything is taken as nutriment beyond that which bread, meat, butter, milk, &c., contain.

When there is an abundance of food in the system, especially of a fatty and farinaceous kind, the use of strong tea and coffee is less harmful. In such a case *weak* black tea and coffee may even act as digestive agents.

Those who have been in the habit of taking strong tea and coffee, may take cocoa as a substitute; which, if *pure*, is very nutritious; or milk, and the result will be a keener relish for food, with more uniform health and spirits.

HURTFUL PROPERTIES OF TEA AND COFFEE, AS SHOWN BY EXPERIMENTS ON ANIMALS.

Dr. Burdell, a distinguished physician of New York, informs us that he boiled down a pound of young Hyson tea from a quart to half a pint, and that ten drops of it killed a rabbit three months old; and when boiled down to one gill, eight drops of it killed a cat of the same age in a few minutes. Think of it! Most persons who drink tea use not less than a pound in three months, and yet a pound of Hyson tea contains poison enough to kill, according to the above experiment, more than 17,000 rabbits, or nearly 200 a day! And if boiled down to a gill, it contains poison enough to kill 10,860 cats in the same space of time!

Similar trials with black tea and coffee were made, and the results were nearly the same.

Now, from these facts, it is surely impossible to believe that any person can take strong tea and coffee daily without injuring their health.

CONCLUDING REMARKS ON NARCOTICS.

We have, in our lessons on this subject, supposed ourselves to be addressing more particularly youth, and others who have not adopted the practice of habitually using narcotics in any form, and we would now endeavour to enforce more strongly what we have said.

We have already shown, in the cases named in our lesson on opium, how the powers of the human stomach may be dallied with till they are fatally perverted. We would, therefore, warn our readers against commencing the practice of taking narcotics with the idea that having once begun the appetite may be easily controlled. It is often said,—'Oh! I can leave them off at any time when I have a mind to!' but it so happens that, once confirmed in the habit, men have not 'a mind' to leave off. Remember, reader, that having commenced the practice of using narcotics in one form, you will be rendered susceptible to their use in any and every other form. Count the cost, therefore, before you begin. But while we are thus writing, we must not forget that there may be some among our readers—even among our youthful readers—who have commenced the use of narcotics in some form or other, and who may wish to free themselves from the habit, but have felt difficulty in doing so. We would, therefore, in concluding our remarks, offer a few directions for their benefit.

Before laying down our rules, however, we must put a few questions to them, and if these questions be answered in the affirmative, they may rest assured that there is some hope of their being cured of these hurtful practices:—

Do you *desire* to be free from the habit of using narcotics? Would you, if you could, cease the use of opium, tobacco, snuff, or alcohol to-day?

Are you willing to do anything for yourselves in this matter? We know you will do whatever you like to do if you can. What we want you to do then is to follow our rules for a sufficient length of time.

First. As to opium, tobacco, and alcoholic liquors.—Whenever you feel a desire for your accustomed dose, or pipe, or glass, before you touch it, resort to the use of pure cold water. Drink a pint or more—as much as you can get into the stomach; then apply the water freely to your head and face. Persevere in doing so until your appetite for these narcotics ceases.

Second. As to snuff.—Whenever you wish to take your usual pinch, have recourse immediately to a basin of cold water, and from your hand sniff a quantity into your nostrils, and then let it out again; continue doing this for some minutes. The object is to bring the water into contact with the nerves which have been perverted by the snuff, and if a little pains be taken, the method here prescribed will be the means of entirely restoring them to their natural healthy condition.

We have no hesitation in saying that if these rules be adopted, a liking for the narcotics named may be entirely eradicated. This may be done often in a few days, or weeks at most, and always with perfect safety and beneficial results.

The late Sir Benjamin Brodie had a horror of narcotics, especially of tobacco, and made it his practice, when consulted by a smoking patient, to take down a volume containing an article contributed by Dr. Parris to a medical encyclopædia, which exhibited, in forcible language, the deleterious properties of the nicotian weed. Scared by the earnest warnings of Sir Benjamin, and by the strenuous protest against the use of tobacco which the great surgeon borrowed from the page of Dr. Parris, many an epileptic sufferer has gone forth from the well-known house in Savile-row with a resolute determination to abjure smoking thenceforward and for ever.

A sick man's appetite desires that most which would increase his evil.

We have all a propensity to grasp at forbidden fruit.

We should enjoy our health when good; be patient when it is bad; and never apply violent remedies except in extreme necessity.

ON MENTAL EXCITEMENT.

Oh! grief hath changed me since you saw me last;
And careful hours, with Time's deformed hand,
Have written strange defeatures in my face.

Every observant person knows that the vicissitudes of life, even in the ordinary hourly intercourse of society, subject us to a great variety of mental emotions. Not one of these emotions, however transient, passes away without having had an effect upon some part of the body. Every degree of mental anxiety, from whatever cause; every little disappointment; every excitement, either of joy or of sorrow; every feeling of shame, surprise, or alarm, has its action upon the functions of the body; and when we consider the many thousands engaged in commercial speculations, the numbers tortured by failures in business, by disappointed ambition, blighted affections, or sudden losses, by the angry excitement of political and religious warfare, and by petty social troubles, in every grade of life, we need not be surprised at the fact, that the amount of infirmity and disease from mental causes alone is beyond all calculation. A man may, through favourable circumstances, travel comparatively unscathed through the physical evils which surround him, but he is so hemmed in by moral agencies, that sorrow or anxiety, in one form or another, is sure to overtake him sooner or later, and when it does overtake him, is sure to do its work upon that frail tenement, his body.

Although it is almost superfluous to enter here into a minute explanation as to this subject, still it is necessary that a few facts should be stated, showing how mental excitement, in various forms, operates upon the body and affects the health. It is through the nerves that emotions of the mind are communicated to the body, and that the vitality of every portion of our system is sustained. The nervous system is, so far as our physical functions are concerned, the seat of power and the source of health.

When the mind is subjected to some strong emotion, nervous power will be withdrawn from the stomach, digestion will be impeded, and only a small quantity of food will be assimilated. The stomach will therefore call for less food, and the appetite become reduced, insufficient nutriment will be taken, and, as a consequence, the health will suffer.

Anxiety of mind will produce such effects, but anxiety and grief do not affect the digestive organs alone; the circulation becomes languid, and the sufferer, absorbed in one or other of these emotions, becomes incapable of any great exertion either of body or mind.

Strong alternations of hope and fear, as in the excitements of ambition or speculation, affect more particularly the action of the heart and the motion of the blood, causing feverish excitement of the brain and the heart, not unfrequently ending in disease of those important organs; and when the functions of these organs are deranged, the health must of necessity give way. What the ultimate effect upon the body may be will depend, in a great measure, upon individual peculiarities of constitution.

Many mental emotions have an instantaneous and powerful effect upon the action of the heart. When the mind is paralysed by fear, the contractile power of the heart being relaxed, the venous blood rushes back to fill its cavities; the skin consequently becomes pale and blanched, and if the frame be very weak, or the emotion very excessive, the action of the heart ceases, and fainting ensues—sometimes even death.

When, on the other hand, the mind is excited by a pleasurable emotion, the action of the heart receives an impulse of nervous energy, a thrill of agreeable sensation pervades the body, the countenance becomes radiant, and the skin is suffused with an increased flow of blood. These are the general results; but even this emotion may be so excessive as to vent itself in such profuse bodily activity, and exuberance of animal spirits, as may be attended with serious consequences.

Too much mental exercise, as in study, withdraws nervous power from the stomach. For while mental exercises or emotions require a large proportion of the nervous energy, they do not absorb the secretions provided by nature for the supply of muscular action, and for those excretions through the skin which are always retarded by much study and those sedentary pursuits which occupy the mind more than the body.

The mind, like the body, should never be taxed to its full power. Length of days is not attainable with unrelaxed powers of mind.

From these facts we readily arrive at the conclusion that a life of mental excitement—a life of anxiety, fear, grief, excessive study, &c.—has a dangerously depressing influence upon the whole animal economy, while, on the contrary, pleasurable emotions generally have a tendency to stimulate the functions of life, and revive the powers of nature.

INSTANCES OF THE EFFECTS OF MENTAL EXCITEMENT ON THE BODY OBSERVABLE IN DAILY LIFE.

It would be easy to adduce an abundance of instances from our various social relations, *showing* the violent effects of strong and sudden mental emotions upon the body, and to illustrate the effect of those more frequent and less violent emotions to which we are all more or less subject. But our space will only admit of a reference to a few of those cases which every observant person must have noticed daily in common life.

Take a case of what is termed mental anxiety—a continued exercise of the mind upon some trouble in business, such as we see arising from the numerous failures in the commercial world. What a difference do we find sometimes a few weeks of anxiety will produce upon a man in such a position, especially if he be an honest man—one possessing strong moral principles. His health and personal appearance, we observe, are changed as a consequence of this anxiety; and if we follow him until he is released of his cares, we discover immediately the reviving effect upon him of such a relief—his spirits again become buoyant, and his health is restored.

As another example, we may notice the case of persons who have sustained calamity. A misfortune happened to a person, say a year ago; observe him some time afterwards—he is wasted, worn, the miserable shadow of himself; inquire about him at the distance of a few months, and you will probably hear that death has terminated his troubles. If this be not the case, and the mind has recovered its elasticity, the bodily effects will be seen to remain often during life, frequently terminating in melancholy and mania.

It is not unusual to see a strong man, who may scarcely have had a day's illness in his life, entirely broken down by a sudden bereavement or misfortune. He bows his head with an inward feeling that he shall never rise again. In some instances such is the result; in other cases time and pious resignation temper the anguish, and the body recovers, if not its former strength, a condition somewhat approaching it.

To these examples may be added those of men who have spent their lives, or a portion of their lives, in vicious courses. How often it occurs that such persons, feeling that they have violated their moral nature, and disregarded the emotions of conscience, suffer severely in their bodily health, and as a consequence are driven to madness, or even to suicide.

With such facts as these before us, surely we cannot fail to see the importance, if we regard our health and happiness, of diligently keeping watch over our thoughts and our feelings, not allowing our passions to become our masters.

Let us, then, in order to attain this end, cultivate a humble, contented, and pious frame of mind, under all the changes and vicissitudes of life, and health and happiness will not fail to be our reward.

ON HEALTH IN ITS RELATION TO THE INTELLECTUAL AND MORAL CHARACTER.

O blessed health! thou art above all gold and treasure; 'tis thou who enlargest the soul, and openest all its powers to receive instruction, and to relish virtue.

THE influence of the body on the intellectual and moral character is so well known, and of such vast importance as affecting a man's welfare and happiness in the world, that, although it would be a superfluous task to enter minutely into details upon the subject here, it demands our general consideration.

First, as to the relation of health and physical strength to the intellectual character, it has been observed that the virtues of courage and fortitude depend greatly on bodily vigour. Courageous and high-minded men are generally found to be physically strong and well formed. Dr. Johnson remarks that: 'Courage results from a consciousness of physical strength, and cowardice from a consciousness of physical weakness. The strong will not shun danger, because he feels himself competent to resist and repel it. The weak man, knowing himself unable to surmount danger by an exercise of strength which he does not possess, will resort to other means of preservation—to petty cunning, wily stratagem, mean subterfuge, lying, and circumvention; thus the virtues which are directly opposed to these vices all depend to a very considerable extent on courage, and courage depends on physical strength—on the liveliness and energy with which the functions of our animalization are performed.'

'Take the brave and hardy mountaineer from his hills,' says the same writer, 'lap him in luxury, let him be fed on dainties, and couched on down, let his lullaby be sounded by the "soft breathing of the lascivious lute," instead of the wild music of the whistling wind; and he will be reduced, first physically, and then intellectually, to the helpless condition of the voluptuary. In a few years replace him on his mountain-top, set him beside his former companions, show him the aggressor against his rights, the oppressor of his race—bid him meet and repel the common enemy. Behold! his courage has fled, the love of liberty and independence is dead within him, the spirit of freedom sleeps; he trembles and yields, preferring the indolence of slavery to the toil necessary to preserve him free.'

Now, these remarks are equally true whether applied to men or to the animal creation. It is remarkable that animals, as well as men, whose conduct is courageous and noble, are generally found to possess physical strength and well-proportioned bodies, while, on the contrary, those that are craven in spirit and conduct are generally weak or ill-formed. Thus Shakespeare draws the character of King Richard I., who was physically strong, as the 'lion-hearted,' and King John, who was a dyspeptic, as the 'craven coward.'

The man who has never been familiarized to bodily exertion and feats of agility sees danger in every encounter, while he whose bodily powers are completely developed is much less affected by the events of life, however unforeseen or threatening they may be. Habituated to the use of every muscle, he places confidence in his strength and address. He is inaccessible to fear, and the courage which we often admire in men is absolutely nothing but the result of a conviction of their own powers. We may truly affirm that he who has the means of preserving himself with safety in the accidental circumstances of life is more capable of courageous actions than those whose courage is paralysed by the want of force and dexterity.

It may be objected that we have numerous instances of undoubted courage in men possessing but little physical strength; but this objection is of little or no weight, compared with the facts above stated as true of men generally.

Secondly, it is not only to the intellectual, but to the moral nature that health and physical strength bear such an important relation.

Nature has given to the body great influence over the mind—its thoughts, its emotions, its passions, its affections, its conscience. It has been well and truly observed that 'the physical is the father of the moral man.' A man's moral character is always altered when his physical conditions are changed. Numerous instances in proof of this occur daily around us, and come under our personal observation. The most eminent men have ever entertained the opinion that good temper, cheerfulness of disposition, and lively spirits depend much upon health, as well as other physical conditions; and that the practices which draw out all the resources of bodily beauty tend likewise to the maintenance of purity of mind. We can never impress too strongly on our memory the fact that peevishness, moroseness, anger, hatred, envy, grief, revenge, and unamiability have a physical development, and must follow rigidly the form and culture of the human body and mind, as it is only through the body that these passions are manifested. Moral acts are generally types of bodily conditions.

A man with a well-balanced body and mind will always struggle more successfully with mental distress and the turbulence of the passions than one whose physical and mental nature are undisciplined; because, in the former case, the possessor knows that all that takes place in the universe, for good or evil, is subservient to the fixed, unalterable laws of the Creator.

CONCLUDING REMARKS ON HEALTH.

HAVING thus far referred to the nature of health, the conditions which must be observed in order to obtain it, and to the advantages and blessings that attend it in its various relations, we wish, in conclusion, to impress more fully upon the minds of our youthful readers especially the vast importance of a careful and serious consideration of the subject.

Let them think of the value of health. Health, even to one individual, is worth more than millions of gold; and if this inestimable treasure can be obtained by the observance of certain conditions, how anxious they should be to know what those conditions are, and to practise them. Unhappily, however, thousands go on in ignorance, until in most cases it is too late to repair the mischiefs done. How many listless and enfeebled frames would be roused, refreshed, and made fit for the wear and tear of protracted life; how many minds sinking into imbecility from actual lassitude, or oppressed by the melancholy of fancied cares, would be stirred by the busy and cheerful objects of worldly enterprise, if more attention were devoted to health. We would remind those who are too ardently devoted to learning or to business, that in all their toil and care and penury of time, they are not gainers if health be neglected. They may appropriate to their idol object hours that should be sacred to their own service, and in so doing they are losers. Let them husband their moments as niggardly as they will, there is a certain reckoning which they must daily have with themselves—a certain time for their own rest and refreshment; and if that time be not granted, it becomes no matter of idle debtorship; day after day registers a fresh account against them, and at the end of a few years the unsuspected fact of premature old age is announced by decrepitude, decay, and death.

In writing on this subject, Locke wisely observes that 'If by gaining knowledge we destroy our health, we labour for a thing that is useless in our hands; and if by harassing our bodies we deprive ourselves of the abilities and opportunities of doing that good we might have done with a meaner talent, which God thought sufficient for us, we rob God of so much service, and our neighbour of all that help which, in a state of health, with moderate knowledge, we might have been able to perform. He that sinks his vessel by overloading it, though it be with gold and silver and precious stones, will give his owner but an ill account of his voyage.'

Remember, youthful reader, that in this *matter of* health, as in all matters affecting your well-being, there should be no procrastination, no deferring to a future time that which concerns you now. The remark is often made that 'we never sufficiently appreciate health till it is lost.' Alas! that you should wait till maladies seize upon you before you give your minds to the consideration of a subject on which your comfort and happiness so much depend.

In the season of youth, while so abundantly supplied with the sap of life, while the fountains are so full that they seem incapable of ever failing, there is a tendency to presume too much upon the strength of the constitution, and to make those invasions upon it which afterwards cost a bitter and unavailing repentance.

Let not the young think that there is time enough to learn all this, and that it is only meant for grown-up people, who will not attend to it. It is with the *young* that reform in these matters must rest, and all young persons have the power to begin that reform in themselves. Grown-up people do not know the evils resulting from a proper attention to the rules of health, because in their school-days they were not taught them. No such excuse can be pleaded now for the young, who have ample opportunities of gaining a knowledge of these things.

To comply with the conditions of health will involve much self-denial, but this will be soon found greatly to increase rather than diminish real enjoyment. Unless our young readers determine to practise this self-denial, and to profit by this teaching while they have the opportunity, they will probably have to learn it more effectually under a sterner master, who will come in the shape of disease, and leave behind him the scars of a severe chastisement.

Finally, we would counsel all parents to reflect on this subject. Let the right kind of information relating to health be diffused among our youth. Let suitable books be placed in their hands. Let the laws of health, and attention to the duties concerning the body, form part of their education, and be considered as an important branch of moral teaching; so that they may learn that progress in knowledge and education is of little worth if there be ignorance of those laws, and that it is as much their duty to attend to their bodily health as it is to be honest and truthful and kind.

All animals appear more happy than man. Look, for instance, on yonder ass: all allow him to be miserable. His evils, however, are not brought on by himself: he feels only those which nature has inflicted. We, on the contrary, besides our necessary ills, draw upon ourselves a multitude of others.

We can be thankful to a friend for a few acres, or a little money, and yet for the great benefits of our being, our life, our health, and reason, we look upon ourselves as under no obligation.

ON SELF-PRESERVATION.

Our time is fix'd, and all our days are numbered;
How long, how short, we know not: this we know,
Duty requires we calmly wait the summons,
Nor dare to stir till Heaven shall give permission.
Those only are the brave who keep their ground,
And keep it to the last. To run away
Is but a coward's trick; to run away
From this world's ills, that at the very most
Will soon blow o'er, thinking to mend ourselves,
By boldly vent'ring on a world unknown,
And plunging headlong in the dark, 'tis mad;
No frenzy half so desperate as this.

Among others the youthful reader must have observed the little value which some persons attach to human life. Our newspapers are daily recording instances in which men, and in some cases even youths, commit the awful crime of suicide. Unhappily, this fearful crime appears to be on the increase; and, therefore, it becomes our duty not to overlook the subject in our instruction; for, surely, with such facts before us, instruction must be needed. One is apt to imagine, in reflecting on these things, that the perpetrators of such deeds have never regarded themselves as human beings responsible to God for the gift of life, and that to rush into His presence unbidden, by destroying that life, they are committing one of the most flagrant of sins. Human life is bestowed by the Creator for wise and holy purposes, and should be regarded by all as a sacred trust, for the use of which all will have to give an account.

Suicide is a wickedness which, though it must raise the most lively compassion, or rather the most exquisite sorrow, is yet the object not only of disapprobation but of horror; and if it be the effect of intemperance, atheism, gaming, disappointment in any unjustifiable pursuit, or dissatisfaction with the dispensations of Providence, it is of all enormities the most unnatural and atrocious, being, with respect to God, an act of the most presumptuous impiety, precluding, if the death be sudden, repentance and, consequently, the hope of pardon; with respect to dependants and friends most cruel and ungenerous, and with respect to the perpetrator cowardly in the extreme. It is, indeed, so shocking to nature, that we can hardly conceive it possible for any person in his perfect mind to be guilty of it. And our laws are willing to suppose that in almost all cases it is madness, and cannot take place till man, by losing his reason, ceases to be an accountable being. A suicide has been compared to a soldier on guard deserting his post; but we should rather consider a set of these desperate men who rush on certain death as a body of troops sent out on the *forlorn hope*. They meet every phase of death, however horrible, with the utmost resolution: some blow their brains out with a pistol, some expire by poison, some fall on the point of their own swords, and others bleed to death. But this false notion of courage, however noble it may appear to the desperate and abandoned, in reality amounts to no more than the resolution of the highwayman, who shoots himself with his own pistol when he finds it impossible to avoid being taken. All practical means, therefore, should be devised to extirpate such absurd bravery, and to make it appear every way horrible, odious, contemptible, and ridiculous. From reading our public prints, a foreigner might be naturally led to imagine that we are the most lunatic people in the world. Almost every day informs us that the coroner's inquest has sat on the body of some miserable suicide, and brought in their verdict of lunacy. Every man in his sober senses must wish that the most severe laws that could possibly be contrived were enacted against suicides. This shocking bravado never did prevail among the more delicate and tender sex in our own nation, though history informs us that the Roman ladies were once so infatuated as to throw off the softness of their nature and commit violence on themselves, till the madness was curbed by holding them up to public reproach. The cause of these frequent self-murders amongst us has often been imputed to the peculiar temperature of our climate. That our spirits are in some measure influenced by the climate cannot be denied; but surely we are not such mere barometers as to be driven to despair and death by the small degree of gloom that our winter brings with it. If we have not so much sunshine as some countries in the world, we have infinitely more than many others. Our climate exempts us from many diseases to which more Southern nations are naturally subject, and we can never be persuaded that being born in a variable climate is a physical cause sufficient to account for the self-murders among us.

Despair, indeed, is the natural cause of these shocking actions; but this is, in most cases, despair brought on by ambition and extravagance, or dissipation and vice. Ambitious and extravagant men involve themselves in difficulties, and then resort to suicide to deliver them of their lives and their cares, while the last-named—the depraved and vicious—who spend their time in lewd company, or on race-courses and in gambling-houses, are induced to kill themselves from motives arising from the miseries which they suffer as the effects of their vices. For our part, when we see young men entering on such courses, we cannot help looking on them as entering the path of death, and, in a manner, digging their own graves.

THE STORY OF A YOUTH WHO DISREGARDED THE DUTY OF SELF-PRESERVATION.

The following case appeared not long since in the newspapers, and we quote it here for the purpose of illustrating the lamentable effects of disregarding the duty of self-preservation :—

'The coroner has received information that one of the boys on board the ship "Warspite," off Charlton, has committed suicide by hanging himself in a fit of temper. The lad, who was named George Dodson, aged fifteen, was admitted by the Marine Society on the 18th ult., and on Wednesday was placed in solitary confinement for misconduct, and half-an-hour afterwards was found hanging by his comforter quite dead. On the discovery being made, there were some signs of insubordination amongst the other boys, and Captain Phipps, the commander, went on shore for the assistance of the police, and order was restored.'

Doubtless, on reading this account, our young readers will be filled with surprise and horror.

Here is a youth, only fifteen years of age, committing the awful crime of self-murder. What are the lessons to be learned from such a sad event as this?

Surely the lad who committed such wickedness could never have seriously thought of the value of human life and its responsibilities, or of the solemnity of death. He had probably thousands of times repeated the commandment, 'Thou shalt do no murder,' and heard good advice from his teachers, but he had not allowed any of these to influence his thoughts, feelings, conscience, or conduct. Think of the steps by which he was led to this act of self-destruction.

Ignorance and disregard for instruction we may consider as the first step. This led to uncontrolled passion—the second step; then followed insubordination to his teachers—the third step; and then came the fourth and final step—he hanged himself in a 'fit of temper.' How fearful must have been the state of mind which urged him to deprive himself of the precious blessing of life! No provocation received from his teachers could have led to such lamentable results if he had possessed the slightest self-respect or reflection or good feeling. Here, indeed, we have a sad instance of what ignorance and disregard for instruction will lead to.

Reflect, young reader, on this mournful story, and the lessons it conveys. If you value your peace, temporal and eternal, set a high value on your life as a blessing bestowed on you by the Creator for your happiness, and to preserve which is the most important of duties, but to destroy which is the most heinous of crimes—a crime not only most unnatural, but contrary to the word of God, who alone is the giver and *disposer* of life, 'in whose hand our breath is and whose are all our ways.' Watch over your thoughts, feelings, conscience, curb every tendency to an evil temper, pay a proper regard to those who instruct you, and value their teaching. Then, instead of imitating the conduct of George Dodson, you will prolong and enjoy your life, and be beloved both by God and man.

He died
As one that had been studied in his death
To throw away the dearest thing he own'd
As 'twere a careless trifle.

For the credit of virtue it must be admitted that the greatest evils which befall mankind are caused by their crimes.

You should not fear, nor yet should you wish for, your last day.

If this life is unhappy, it is a burden to us which it is difficult to bear; if it is in every respect happy, it is dreadful to be deprived of it.

If the thought of death be not pleasant to you, hearken to every temptation to sin as you would hearken to a temptation to self-murder. You love not death; love not the cause of death.

What we call life is a journey to death; and what we call death is a passport to life. Let us then, like sentinels, be ready because we are uncertain, and calm because we are prepared. The shortest life is long enough if it lead to a better, and the longest life is too short if it do not.

MORAL LESSONS FROM THE TEACHING OF THE SCRIPTURES.

Of Temperance.

ADD to knowledge temperance, and to temperance patience.

Every man that striveth for the mastery is temperate in all things.

The fruit of the Spirit is temperance; against such there is no law.

Of Intemperance.

Be not drunk with wine, wherein is excess.

Keep not company with a drunkard; and with such a one eat not.

Wine is a mocker, strong drink is raging; and whosoever is deceived thereby is not wise.

Be not among wine-bibbers; among riotous eaters of flesh: for the drunkard and the glutton shall come to poverty.

Who hath woe? who hath sorrow? who hath contentions? who hath babbling? who hath wounds without cause; who hath redness of eye? They that tarry long at the wine; they that go to seek mixed wine. Look not thou upon the wine when it is red, when it giveth his colour in the cup, when it moveth itself aright: at the last it biteth like a serpent and stingeth like an adder. Thine eyes shall *behold* strange women, and thine heart shall utter perverse things: yea, thou shalt be as he that lieth down in the midst of the sea, or as he that lieth upon the topmast. They have stricken me, shalt thou say, and I was not sick; they have beaten me, and I felt it not: when shall I awake? I will seek it yet again.

Of Industry.

In all labour there is profit.

Whatsoever thy hand findeth to do, do it with thy might.

He that tilleth his land shall have plenty of bread; but he that followeth after vain persons shall have poverty enough.

Seest thou a man diligent in business? he shall stand before kings; he shall not stand before mean men.

Wealth gotten by vanity shall be diminished; but he that gathereth by labour shall increase.

The sleep of a labouring man is sweet, whether he eat little or much; but the abundance of the rich will not suffer him to sleep.

Of Idleness.

Be not slothful in business; but fervent in spirit, serving the Lord.

He that is slothful in his work, is brother to him that is a great waster.

The hand of the diligent shall bear rule, but the slothful shall be under tribute. The slothful man roasteth not that which he took in hunting; but the substance of a diligent man is precious.

A slothful man hideth his hand in his bosom, and will not so much as bring it to his mouth again.

The desire of the slothful killeth him; for his hands refuse to labour. He coveteth greedily all the day long.

Slothfulness casteth into a deep sleep; and an idle soul shall suffer hunger.

Drowsiness shall cover a man in rags.

Go to the ant, thou sluggard; consider her ways, and be wise; which having no guide, overseer, or ruler, provideth her meat in the summer, and gathereth her food in the harvest. How long wilt thou sleep, O sluggard? when wilt thou arise out of thy sleep? Yet a little sleep, a little slumber, a little more folding of the hands to sleep; so shall thy poverty come as one that travelleth, and thy want as an armed man.

Of Purity of Life.

Blessed are the pure in heart: for they shall see God.

He that loveth pureness of heart, for the grace of his lips the king shall be his friend.

Flee youthful lusts; but follow righteousness, faith, charity, peace, with them that call on the Lord out of a pure heart.

Unto the pure all things are pure, but unto them that are defiled and unbelieving is nothing pure, but even their mind and conscience is defiled. They profess that they know God, but in works they deny Him, being abominable and disobedient, and unto every good work reprobate.

Beloved, now are we the sons of God, and it doth not yet appear what we shall be; but we know that, when He shall appear, we shall be like Him; for we shall see Him as He is. And every man that hath this hope in him purifieth himself, even as he is pure.

Of Unchastity.

Dearly beloved, I beseech you as strangers and pilgrims abstain from fleshly lusts which war against the soul.

Flee youthful lusts, but follow righteousness, faith, charity, peace, with them that call upon the Lord out of a pure heart.

Denying worldly lusts, we should live soberly, righteously, and godly in this present world.

When lust hath conceived it bringeth forth sin, and when sin hath conceived it bringeth forth death.

Thou shalt not commit adultery.

Whoso committeth adultery with a woman lacketh understanding; he that doeth it destroyeth his own soul.

Whosoever shall put away his wife, except it be for fornication, and shall marry another, committeth adultery; and whosoever marrieth her that is put away from her husband, committeth adultery.

Ye have heard that it was said by them of old times, Thou shalt not commit adultery: but I say unto you, that whosoever looketh on a woman, to lust after her, hath committed adultery with her already in his heart.

MORAL SAYINGS OF THE WISE AND GOOD OF VARIOUS AGES AND NATIONS.

Proverbs from the Book of Wisdom, Ecclesiasticus, &c.

HEALTH and good estate of body are above all gold, and a strong body above infinite wealth.

There is no riches above a sound body, and no joy above the joy of the heart.

Death is better than a bitter life or continual sickness.

Delicates poured upon a mouth shut up are as masses of meat set upon a grave.

Give not over thy mind to heaviness, and afflict not thyself in thine own counsel.

The gladness of the heart is the life of man, and the joyfulness of a man prolongeth his days.

Love thine own soul, and comfort thine heart; remove sorrow far from thee: for sorrow hath killed many, and there is no profit therein.

Envy and wrath shorten the life, and carefulness bringeth age before the time.

A cheerful and good heart will have a care of his meat and diet.

Watching for riches consumeth the flesh, and the care thereof driveth away sleep.

Watching care will not let a man slumber, as a sore *disease* breaketh sleep.

If thou sit at a bountiful table, be not greedy upon it, and say not, There is much meat on it.

Stretch not thy hand whithersoever it looketh, and thrust it not into the dish.

Judge of thy neighbour by thyself: and be discreet in every point.

Eat, as it becometh a man, those things which are set before thee; and devour not, lest thou be hated.

Leave off first for manners' sake; and be not unsatiable, lest thou offend.

When thou sittest among many, reach not thine hand out first of all.

A very little is sufficient for a man well nurtured, and he fetcheth not his wind short upon his bed.

Sound sleep cometh of moderate eating: he riseth early, and his wits are with him: but the pain of watching, and choler, and pangs of the belly, are with an unsatiable man.

My son, hear me, and despise me not, and at the last thou shalt find as I told thee: in all thy works be quick, so shall there no sickness come unto thee.

Whoso is liberal of his meat, men shall speak well of him; and the report of his good housekeeping will be believed.

But against him that is a niggard of his meat the whole city shall murmur; and the testimonies of his niggardness shall not be doubted of.

Show not thy valiantness in wine; for wine hath destroyed many.

The furnace proveth the edge by dipping: so doth wine the hearts of the proud by drunkenness.

Wine measurably drunk and in season bringeth gladness of the heart, and cheerfulness of the mind:

But wine drunken with excess maketh bitterness of the mind, with brawling and quarrelling.

Drunkenness increaseth the rage of a fool till he offend: it diminisheth strength, and maketh wounds.

A wise man shall inherit glory among his people, and his name shall be perpetual.

My son, prove thy soul in thy life, and see what is evil for it, and give not that unto it.

For all things are not profitable for all men, neither hath every soul pleasure in every thing.

Be not unsatiable in any dainty thing, nor too greedy upon meats:

For excess of meats bringeth sickness, and surfeiting will turn into choler.

By surfeiting have many perished; but he that taketh heed prolongeth his life.

Honour a physician with the honour due unto him for the uses which ye may have of him: for the Lord hath created him.

For of the most High cometh healing, and he shall receive honour of the king.

The skill of the physician shall lift up his head: and in the sight of great men he shall be in admiration.

The Lord hath created medicines out of the earth; and he that is wise will not abhor them.

Was not the water made sweet with wood, that the virtue thereof might be known?

And He hath given men skill, that he might be honoured in His marvellous works.

With such doth He heal men, and taketh away their pains.

Of such doth the apothecary make a confection; and of His works there is no end; and from Him is peace over all the earth.

My son, in thy sickness be not negligent: but pray unto the Lord that He will make thee whole.

Leave off from sin, and order thine hands aright, and cleanse thy heart from all wickedness.

Give a sweet savour, and a memorial of fine flour; and make a fat offering, as not being.

Then give place to the physician, for the Lord hath created him: let him not go from thee, for thou hast need of him.

There is a time when in their hands there is good success.

For they shall also pray unto the Lord, that He would prosper that, which they give for ease and remedy to prolong life.

---

*Select Sentences.**

BEAUTY is spread abroad through earth and sea and sky, and dwells on the face and form, and in the heart of man.

It is shameful for a man to rest in ignorance of the structure of his own body, especially when the knowledge of it mainly conduces to his welfare, and directs his application of his own powers.

---

* The subjects referred to in these Sentences are arranged in the order of subjects of preceding Lessons, pages 1 to 205.

Whoever considers the study of anatomy, I believe, will never be an atheist; the frame of man's body, and coherence of his parts, being so strange and paradoxical, that I hold it to be the greatest miracle of nature.

In the constitution both of our body and of our mind, everything must go on right, and harmonise well together to make us happy.

The aim of all is but to nurse the life,
With honour, wealth, and ease in waning age.

Learn to live well, or fairly make your will;
You've play'd and lov'd, and ate and drank your fill;
Walk sober off, before a sprightlier age
Comes titt'ring on and shoves you from the stage.

In vain we summon the mind to intense application when the body is in a languid state.

A healthy old man, if he be wise, is the happiest creature living. It is at that time of life only men enjoy their faculties with pleasure and satisfaction. It is then we have nothing to manage, we speak the truth, and whether the rest of the world will give us the privilege or not, we have so little to ask of them that we can take it.

Learn from the birds what food the thickets yield;
Learn from the beasts the physics of the field.

Physic is of little use to a temperate person, for a man's own observation on what he finds does him good, and what hurts him, is the best physic to preserve health.

It is not the quantity of meat, but the cheerfulness *of the guests*, which makes the feast.

Who lives to Nature rarely can be poor;
Who lives to Fancy never can be rich.

A surfeit of the sweetest things
The deepest loathing to the stomach brings.

Seldom we shall see in cities, courts, and rich families, where men live plentifully, and eat and drink freely, that perfect health, and vigour of constitution, which is commonly seen in the country, in poor houses and cottages, where nature is their cook, and necessity their caterer, and where they have no other doctor but the sun and fresh air, and that such a one as never sends them to the apothecary.

Fools! not to know how far a humble lot
Exceeds abundance by injustice got;
How health and temperance bless the rustic swain,
While luxury destroys her pamper'd train.

Except thou desirest to hasten thine end, take this for a general rule, that thou never add any artificial heat to thy body by wine or spice. The sooner thou beginnest to help nature, the sooner she will forsake thee, and leave thee to trust altogether to art.

The chief pleasure in eating does not consist in costly seasoning, or exquisite flavour, but in yourself. Seek your sauce in exercise.

He that prolongs his meals, and sacrifices his time, as well as his other conveniences, to his luxury, how quickly does he outset his pleasure!

Many people are too apt to live beyond their incomes. They acquire a taste for luxuries and amusements which can never form any solid foundation for a manly character.

A healthy breathing apparatus is indispensable to success in life. The thorough aëration of the blood by free exposure to a large breathing surface in the lungs, is necessary to maintain that full vital power on which the vigorous working of the brain in so large a measure depends.

God made the country, and man made the town.
What wonder, then, that health and virtue, gifts
That can alone make sweet the bitter draught
That life holds out to all, should most abound
And least be threaten'd in the fields and groves.
There health so wild and gay, with bosom bare,
And rosy cheek, keen eye, and flowing hair,
Trips with a smile the breezy scene along,
And pours the spirit of content in song.

We are told that the inhabitants of Brazil die merely of old age, owing chiefly to the serenity and tranquillity of the air in which they live.

The lark is gay,
That dries his feathers saturate with dew
Beneath the rosy cloud, while yet the beams
Of day-spring overshoot his humble nest.

Hail! holy light, before the sun,
Before the heavens thou wert, and at the voice
Of God, as with a mantle didst invest
The rising world of waters, dark and deep,
Won from the void and formless infinite.

What is beauty? Not the show
Of shapely limbs and features. No;
These are but flowers
That have their dated hours
To breathe their momentary sweets, then go.
'Tis the stainless soul within
That outshines the fairest skin.

Socrates, though primarily attentive to the culture of his mind, was not negligent of his external appearance. His cleanliness resulted from those ideas of order and decency which governed all his actions, and the care which he took of his health from his desire to preserve his mind free and tranquil.

He that upon his back good garments wears
Is wise, though on his head grow Midas' ears.

In dress many study fashion rather than utility. There is generally so much to gaze and stare at in the dress that one's eyes are dazzled and weary, and can hardly pierce through to that which is clothed upon.

Labour, or employment, which Galen calls 'Nature's physician,' is so essential to health and happiness, that indolence is justly considered as the mother of misery.

The man is never half so blest
As when the busy day is spent,
So as to make his evening rest
A holiday of glad content.
I doubt if he who lolls his head
Where idleness and plenty meet,
Enjoys his pillow or his bread
As those who *earn* the meals they eat.

What saith the river,
Majestic in flow,
Moving for ever
Calmly and slow?
'Over my surface the great vessels glide,
Ocean-ward borne by my strong-heaving tide;
Work thou, too, brother, life vanisheth fast,
Labour unceasing, rest cometh at last.'

Youths will never live to age, without they keep themselves in breath with exercise, and in heart with joyfulness.

Sorrow is a kind of rust of the soul, which every new idea contributes in its passage to scour away. It is the putrefaction of stagnant life, and is remedied by exercise and motion.

The pernicious debilitating tendencies of bodily pleasure need to be counteracted by bodily labour; whereas bodily labour without bodily pleasure converts the body into a mere machine, and brutifies the soul.

Choose such pleasures as recreate much, and cost little.

If all the year were playing holidays,
To sport would be as tedious as to work.

Take heed to avoid all those games and sports that are apt to take up much of thy time, or engage thy affections. He that spends all his life in sports, is like one who wears nothing but fringes, and eats nothing but sauces.

Sweet is the peasant's sleep!
Sweet, if by toil he earns his bread:
He knows not half the care and dread
Which agitate the rich man's mind,
And make him watch and weep;
But, casting sorrow to the wind,
Sweet is the peasant's sleep.

Sleep, that knits up the ravell'd sleeve of care,
The death of each day's life, sore labour's bath,
Balm of hurt minds, great nature's second course,
Chief nourisher in life's feast!

No man can promise himself even fifty years of life, but any man may, if he please, by early rising, live in the proportion of fifty years in forty;—let him rise early, that he may have the day before him, and let him make the most of the day.

The temperate man's pleasures are durable because they are regular, and all his life is calm and serene because it is innocent.

Temperance, by fortifying the mind and body, leads to happiness. Intemperance, by enervating them, ends generally in misery.

Let the father of disease be what it may, intemperance is certainly the mother.

The body oppressed by excesses bears down the mind, and depresses to the earth any portion of the divine spirit we had been endowed with.

The misfortune is, that when man has found honey, he enters upon the feast with an appetite so voracious, that he usually destroys his own delight by excess and satiety.

Swinish gluttony
Ne'er looks to heav'n amidst his gorgeous feast,
But with besotted, base ingratitude,
Crams, and blasphemes his feeder.

Were we to survey the chambers of sickness and distress, we should often find them tenanted by the victims of intemperance and sensuality.

Wish chastely and love dearly.

Let grace and goodness be the principal loadstone of thy affections. For love which hath ends, will have an end; whereas that which is founded on true virtue, will always continue.

Such is the power of that sweet passion—love—that it all sordid baseness doth expel.

Virtue never will be moved,
Though lewdness court it in the shape of heav'n.

A close and discreet behaviour is the fittest to receive virtue for its constant guest, because there, and there only, it can be secure. Proper reserves are the outworks, and must never be deserted by those who intend to keep the place.

What saith the fountain,
Hid in the glade,
Where the tall mountain
Throweth its shade?
'Deep in my waters, reflected serene,
All the soft beauty of heaven is seen;
Thus let thy bosom, from wild passion free,
Ever the mirror of purity be!'

Hold not conference, debate, or reasoning, with any lust: 'tis but a preparatory for thy admission of it. The way is, at the very first, flatly to deny it.

The worst of youthful indiscretions is, not that they destroy health, so much as that they sully manhood. The dissipated youth becomes a tainted man; and often he cannot be pure, even if he would.

As the wrong done to another to-day returns upon us to-morrow, so the sins of youth rise up in our age to scourge us.

The excesses of our youth are draughts upon our *old age*, payable with interest, about thirty years after *date*.

Those men who never have experienced the sweets of wisdom and virtue, but spend all their time in revels and debauches, sink downwards day after day, and make their whole life one continued series of errors.

To sensual persons hardly anything is what it appears to be, and what flatters most is always farthest from reality. There are voices which sing around them, but those strains allure to ruin. There is a banquet spread, where poison is in every dish. There is a couch which invites them to repose, but to slumber on it is death.

Oh! save me from the gaiety of those
Whose headaches nail them to a noonday bed;
And save me too from those whose haggard eyes
Flash desperation, and betray their pangs;
From gaiety, that fills the bones with pain,
The mouth with blasphemy, the heart with woe.

The temptation to drink intoxicating liquors is about one of the worst and most deadly, as well as extravagant, temptations which lie in the way of youth. Sir Walter Scott used to say, that 'of all vices drinking is the most incompatible with greatness.'

O thou invisible spirit of wine, if thou hast no name to be known by, let us call thee—Devil! . . O, that men should put an enemy in their mouths, to steal away their brains! that we should, with joy, revel, pleasure, and applause, transform ourselves into beasts!

What's a drunken man like? Like a drown'd man, a fool, and a madman; one draught above heat makes him a fool, the second mads him, and a third drowns him.

All experienced people will tell you that the habit of using strong narcotics, in any shape, will soon render you emaciated and consumptive, your nerves shattered, your spirits low and moody, your throat dry and demanding stimulating drinks.

Refrain to-night;
And that shall lend a kind of easiness
To the next abstinence: the next more easy:
For use almost can change the stamp of nature,
And either curb the spirit, or throw it out
With wondrous potency.

The healthy man is spare in diet;
Free from gross passion, or of mirth, or anger;
Constant in spirit, not swerving with the blood.

Cheerfulness should be encouraged in our youth, if we would wish to have the benefit of it in our old age. Age without cheerfulness is a Lapland winter without a sun.

Cheerful looks make every dish a feast,
And 'tis that crowns a welcome.

Care keeps his watch in every old man's eye,
And where care lodges, sleep will never be;
But where unbruised youth with unstuff'd brain
Doth couch his limbs, there golden sleep doth reign.

Tell me, what is't that takes from thee
Thy stomach, pleasure, and thy golden sleep;
Why dost thou bend thine eyes upon the earth,
And start so often when thou sitt'st alone?
Why hast thou lost the fresh blood in thy cheeks;
And given my treasures, and my rights of thee,
To thick-eyed musing and cursed melancholy?

Care is no cure, but rather corrosive;
For things that are not to be remedied.

With equal mind what happens let us bear,
Nor joy nor grieve too much for things beyond our care.
Like pilgrims to the appointed place we tend;
The world's an inn, and death the journey's end.

The humours of the body have a stated and regular course, which impels and imperceptibly guides our will. They co-operate with each other, and exercise successively a secret empire within us, so that they have a considerable part in all our actions, without our being able to know it.

Cheerfulness and diligence are the life and soul of success, as well as of happiness; perhaps the very highest pleasure in life consists in clear, brisk, conscious working; energy, confidence, and every other good quality mainly depending upon it.

O! deaf to nature, and to Heaven's command;
Against thyself to lift the murdering hand!
O sad despair!—to shun the living light,
And plunge thy guilty soul in endless night!

The two most precious things on this side the grave are our life and our reputation.

END OF PART I. OF THE FIRST BOOK.